Symposium OPEN IVR
Installation, Upgrade, and Maintenance Guide

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Contents

About this guide xxiii
- Purpose of this manual. . . . xxiii
  - Prerequisites xxiv
- Document organization xxiv
  - Supporting Release 4.0 documentation xxvii
- Conventions used in this guide xxix

1 Product overview 1-1
- Introduction. . . . 1-1
- System components. . . . 1-2
- Hardware components 1-3
  - Tower AP with one or more MRS/Towers 1-3
  - Rack AP with one or more MRS/Racks 1-4
  - An MRS/AP 1-5
- Software 1-5
- System security 1-5

2 Before you begin 2-1
- Introduction. . . . 2-1
- Keycodes and certificates 2-1
- Accounts and passwords 2-2
- Safety precautions 2-3
  - Introduction 2-3
  - General safety 2-3
  - Avoiding electrostatic discharge 2-3
  - Precautions for handling component cards 2-4
  - Installing cards 2-4
  - Site safety 2-5
  - Safety precautions used when installing or replacing hardware components 2-5

Cooling and airflow 2-6
Installation and maintenance tools 2-6
Introduction 2-6
Tools required 2-6
Approved replacement parts 2-6
Shutting down the AP or MRS/AP 2-7
Shutting down the MRS 2-8
Shutting down the MRS through the SCI (remotely or locally). . . . 2-9
Shutting down the MRS with the shutdown switch (Release 2.x MRS) 2-10
Changing the system date 2-11
Changing the system time zone 2-11

3 Tower AP (300tp) installation 3-1
Introduction. 3-1
Steps for physical installation of the system. 3-1
Installation roadmap. 3-1
Removing components from packaging. 3-3
Checklist — necessary components for the installation. 3-3
Removing the chassis cover of the AP 3-4
Inspecting the chassis 3-5
Removing the drive bay shipping bracket 3-6
Installing host connectivity options not pre-installed 3-8
Replacing the AP cover 3-9
Connecting peripherals 3-9
Adding a modem for Remote Access Service (RAS). 3-11
Connecting to the LAN. 3-11
Connecting the UPS cable. 3-12
Powering up the system. 3-12
Verify host connectivity options 3-14
Checking the license file 3-14
Final installation steps 3-14

4 MRS/AP (300tp) installation 4-1
Introduction. 4-1
Steps for physical installation of the system. 4-1
Installation roadmap. 4-1
Removing components from packaging. 4-3
Checklist — necessary components for the installation. 4-3
Removing the chassis cover of the MRS/AP 4-4
Inspecting the chassis 4-5

Removing the drive bay shipping bracket 4-6
Installing host connectivity options not pre-installed 4-8
Replacing the MRS/AP cover 4-9
Connecting peripherals 4-9
Adding a modem for Remote Access Service (RAS). 4-11
Connecting to the LAN. 4-11
Connecting the telephony lines 4-11
Connecting the UPS cable. 4-12
Powering up the system. 4-12
Verify host connectivity options 4-14
Checking the license file 4-14
Final installation steps 4-15

5 Tower AP (700tp) and Rack AP installation 5-1

Overview 5-1
Steps for physical installation of the system. 5-1
Installation roadmap. 5-1
Removing components from packaging. 5-3
Checklist — necessary components for the installation. 5-3
Installing the cabinet for the Rack AP (optional) 5-4
Removing the AP chassis cover 5-5
Inspecting the chassis 5-8
Installing host connectivity options not pre-installed 5-8
Replacing the AP covers 5-9
Installing the power supply module(s) in the Rack AP. 5-9
Installing the Rack AP in the cabinet 5-9
Connecting peripherals 5-10
Adding a modem for remote access 5-14
Connecting the cables to the LAN 5-14
Connecting the UPS cable. 5-14
Powering up the system. 5-15
Verify host connectivity options 5-17
Checking the license file 5-17
Final installation steps 5-18

6 MRS/AP (700tp) installation 6-1

Overview 6-1
Steps for physical installation of the system. 6-1
Installation roadmap. 6-1
Removing components from packaging. 6-3
Checklist — necessary components for the installation. 6-3

Removing the chassis cover of the MRS/AP 6-4
Inspecting the chassis 6-6
Installing host connectivity options not pre-installed 6-6
Replacing the MRS/AP covers. 6-7
Connecting peripherals 6-7
Adding a modem for remote access 6-9
Connecting the cables to the LAN 6-9
Connecting the telephony lines 6-9
Connecting the UPS cable. 6-10
Powering up the system. 6-10
Verify host connectivity options 6-12
Checking the license file 6-12
Final installation steps 6-13

7 MRS/Tower installation 7-1

Overview 7-1
Steps for physical installation of the system. 7-1
Installation roadmap. 7-1
Removing components from packaging. 7-2
Checklist — necessary components for the installation. 7-2
Removing the chassis cover of the MRS/Tower 7-3
Inspecting the chassis 7-5
Replacing the chassis cover 7-6
Adding peripherals to the MRS/Tower. 7-6
Adding a modem for Remote Access Service (RAS). 7-8
Connecting the cables to the LAN 7-8
Connecting the telephony lines 7-8
Connecting the UPS cable. 7-8
Powering up the system. 7-9
Checking the license file 7-10
Final installation steps 7-11

8 MRS/Rack installation 8-1

Overview 8-1
Steps for physical installation of the system. 8-1
Installation roadmap. 8-1
Removing components from packaging. 8-2
Checklist — necessary components for the installation. 8-3
Installing the cabinet (optional) 8-3
Removing the chassis cover of the MRS/Rack 8-4
Inspecting the chassis 8-5

Replacing the MRS/Rack chassis cover 8-6
Installing the power supply module(s) in the MRS/Rack 8-6
Installing the MRS/Rack in the cabinet 8-6
Connecting peripherals 8-6
Adding a modem for Remote Access Service (RAS). 8-9
Connecting the cables to a LAN 8-9
Connecting the telephony lines 8-9
Connecting the UPS cable. 8-9
Powering up the system. 8-10
Turning on the MRS/Rack 8-11
Checking the license file 8-12
Final installation steps 8-12

9 Uninterruptible Power Source (UPS) option 9-1

Overview 9-1
UPS models supported 9-1
Release 2 hardware platforms 9-2
Event behavior 9-2
AP 9-2
MRS. 9-3
Preparing for UPS installation 9-3
Safety issues 9-3
Package contents 9-4
System requirements. 9-4
Installing the APC UPS on the AP or MRS/AP. 9-5
Installation of APC UPS on the MRS 9-6
PowerChute plus software installation on the AP, MRS/AP, or MRS 9-7
Installation summary 9-11
Setting up the UPS shutdown procedures 9-11
Verifying proper installation and operation. 9-12
PowerChute plus 4.2.2 operational restriction 9-13
UPS cable pinouts 9-13
PowerChute software plus features. 9-14

10 AP redundancy and replacing an AP or MRS/AP 10-1

Introduction. 10-1
Adding a secondary AP 10-1
Before assigning a secondary AP 10-2
Secondary AP installation and configuration 10-3
Defining the primary and secondary AP 10-3

Re-establishing a connection with the primary AP. 10-3
Replacing an AP or MRS/AP 10-4

11 Remote access 11-1
Overview 11-1
Supported modems 11-1
Customers in North America and some Caribbean and Latin American countries 11-1
Regional exceptions. 11-2
U.S. Robotics 28.8 and 33.6 Fax Modem settings 11-3
Modem installation 11-4
Uninstalling a modem. 11-5
Remote login to the SCI 11-6
Remote login procedure. 11-6
Remote login to the AP, MRS/AP, or MRS using PPP. 11-7
Supported X-terminal emulation software for remote access . . . 11-7
PPP connection 11-7
Remote access to administration tools 11-8
Using ZMODEM communication protocol for transferring files 11-9

12 Replacing or adding an MRS 12-1
Overview 12-1
Replacing an MRS 12-2
Adding an MRS 12-2

13 Host name and IP address change 13-1
Overview 13-1
Default network configuration. 13-2
Default network configuration 13-2
PPP remote access 13-3
TCP/IP Host Communications 13-3
IPML Ethernet Card 13-3
Changing the network configuration 13-3
Hosts files. 13-4
Overview 13-4
Viewing the hosts file on an AP or MRS/AP 13-4
Viewing the hosts file on an MRS 13-4
Aliases required for some installation and maintenance procedures 13-5
Hosts file examples 13-6
rhosts files 13-8

Overview 13-8
Viewing the rhosts file on an AP or MRS/AP 13-8
Viewing the rhosts file on an MRS 13-8
Changing the LAN IP address or host name 13-9
Overview 13-9
Guidelines for updating IP address and host names 13-9
Modifying the host name and IP address. 13-10
Updating the hosts and rhosts files on an MRS. 13-15
Updating the hosts and rhosts files on an AP or MRS/AP 13-16

14 Upgrade procedures 14-1

Introduction. 14-1
Replacing or installing Release 2.x hardware components 14-1
MRS/AP with TTS, UPS, and Madge Token Ring card 14-1
Before you begin 14-2
Upgrade roadmap 14-2
Symposium OPEN IVR 4.0 upgrade package 14-3
Moving application prompts out of the system prompt range. 14-5
Creating a complete system backup 14-6
Installing backup scripts. 14-6
Running backup scripts 14-7
Backing up customized files to restore on upgraded system 14-12
Recording existing hosts file and network configuration information. 14-13
Upgrading User Functions 14-13
Checking if usr_main.c has been customized 14-13
Upgrading your system to Symposium OPEN IVR 4.0 14-14
Report Writer 14-14
Upgrading the AP or MRS/AP 14-15
Upgrading the MRS 14-24
Upgrading the SYNC/570 SDLC host connectivity card 14-30
Replacing the Serial I/O card. 14-31
Restoring customized files 14-32
Restoring Release 4.0 system prompts 14-34
On an MRS/AP 14-34
On an MRS 14-34
Upgrading applications from IVR 2.x 14-35
Upgrading VPF files. 14-35
Modifying User Functions 14-35
Updating Vocabulary Identifiers. 14-36
Updating Vocabulary Identifiers in applications 14-38

Upgrading ADSI Applications from OPEN IVR 2.01 or 2.5 to Symposium OPEN IVR 4.0 14-38
Final steps in the upgrade process 14-40
Making a backup of the upgraded system 14-40
Upgrading the modem on an AP or MRS/AP 14-40
Reinstalling options 14-40
Upgrading from a runtime system to a development system 14-41

15 Backup and failure recovery 15-1
Overview 15-1
Section A: Making a full system image backup of your Symposium OPEN IVR 4.0 system 15-3
Introduction 15-3
Tape drive type and capacity 15-3
Backup time required 15-3
Creating a system image backup 15-4
Creating a full system image backup of the AP, MRS/AP, or MRS 15-4
Section B: Backing up and restoring VSNs and other directories 15-7
Introduction 15-7
Tape drive type and capacity 15-7
Backing up VSNs or other customized files 15-7
Restoring VSNs or other customized files 15-12
Section C: Restoring your Symposium OPEN IVR 4.0 system from a system image backup tape 15-15
Introduction 15-15
Restoring an AP or MRS/AP 15-15
Restoring an MRS 15-17
Section D: Restoring a previous release of OPEN IVR 15-20
Introduction 15-20
AP or MRS/AP restoration from a system image backup tape 15-20
Restoring from the system image backup tape (AP or MRS/AP) 15-20
VSN Volumes Restoration for MRS/AP 15-21
MRS/Tower or MRS/Rack restoration from a system image backup tape 15-26
MIT process preparations for MRS/Tower or MRS/Rack restoration 15-26
Restoring from the system image backup tape (MRS/Tower or MRS/Rack) 15-28
VSN Volumes Restoration for MRS/Tower or MRS/Rack 15-29

Section E: Disk mirroring failure recovery 15-32
Overview 15-32
Rebuilding a defective root or secondary disk 15-32
Replacing a defective root or secondary disk. 15-33
Preparing the replacement hard disk 15-34
Installing the replacement hard disk 15-34
Performing a low-level format on a hard disk 15-34

16 Disk Mirroring option 16-1
Introduction. 16-1
Reference documentation 16-1
Tape backups 16-1
Disk Mirroring serial number and certificate. 16-2
Disk Mirroring option requirements 16-2
Installation roadmap 16-3
Section A: Installing the Disk Mirroring software and hardware (AP, MRS/AP, or MRS) 16-4
Introduction. 16-4
Installing the Disk Mirroring software 16-5
Installing from a CD-ROM drive on the same machine 16-5
Installing from a CD-ROM drive on a remote server 16-6
Completing the Disk Mirroring software installation 16-7
Registering the Disk Mirroring STAR software with Star Technologies/Western Micro 16-8
Physically installing the secondary hard disk 16-9
Mirroring the root disk. 16-10
Section B: Completing the installation 16-11
Completing the installation for the AP Disk Mirroring option 16-11
Activating the AP Disk Mirroring option 16-11
Completing the installation of MRS or MRS/AP Disk Mirroring . . . 16-11
Installing the Disk Mirroring option on the MRS or MRS/AP . . . 16-11
Activating the MRS or MRS/AP Disk Mirroring option 16-14
Installing the license file 16-15

17 LAN card installation 17-1
Overview 17-1
Referenced documentation 17-1
Integrated Package for Meridian Link (IPML) LAN card requirements 17-1
Release 2.x hardware platforms. 17-2
Installing the 3Com Ethernet card 17-3

3Com Ethernet card installation (AP, MRS/AP, or MRS) 17-3
Connecting the 3Com Ethernet card to the LAN 17-4
Recommended LAN cable types 17-8
Changing cable types 17-8
Installing the Madge ISA Token Ring card 17-9
Madge ISA Token Ring card installation (AP, MRS/AP, or MRS) 17-9
Configuring the Madge ISA Token Ring card 17-11
Network configuration 17-14
Replacing a LAN card 17-14
Adding a second LAN card 17-26
Modifying the IP address or host name 17-27

18 SBC card and SIMMs installation 18-1
Overview 18-1
Release 2.x hardware platforms 18-1
Section A: Tower AP (300tp), and MRS/AP (300tp) 18-2
Overview 18-2
SBC card description 18-3
Replacing the SBC card 18-4
Requirements 18-4
Procedure for replacing the SBC card 18-4
Configuring the BIOS 18-5
Overview 18-5
When to configure the BIOS 18-5
Reference 18-5
Procedure for configuring the BIOS 18-6
Adding Single Inline Memory Modules to the SBC 18-6
SIMM description 18-6
Supported SIMM specifications and capacity 18-6
Rules for adding SIMMs 18-7
Requirements 18-7
Procedure for adding SIMMs to the SBC card 18-8
Section B: Tower AP (700tp), MRS/AP (700tp), MRS/Tower, MRS/Rack, Rack AP 18-10
Overview 18-10
SBC card description 18-11
Replacing the SBC card 18-12
Requirements 18-12
Procedure for replacing the SBC card 18-12
Configuring the BIOS 18-14
Overview 18-14

When to configure the BIOS 18-14
Reference 18-14
Procedure for configuring the BIOS 18-14
Adding Single Inline Memory Modules to the SBC 18-15
SIMM description 18-15
Supported SIMM specifications and capacity 18-15
Rules for adding SIMMs 18-15
Requirements 18-16
Procedure for adding SIMMs to the SBC card 18-17

19 Telco interface card installation 19-1

Overview 19-1
Release 2.x hardware platforms 19-2
Dial Pulse Detection feature 19-2
SCbus cabling rules 19-2
Slot assignment rules 19-2
4-port loopstart interface (D/41ESC) 19-3
Description 19-3
Limitations 19-3
Switch settings 19-3
Memory range 19-4
Installing the card 19-6
Activating the D/41ESC card 19-8
16-port loopstart interface (D/160SC-LS) 19-11
Description 19-11
Limitations 19-11
Switch settings 19-11
Memory range 19-11
Installing the card 19-13
Activating the D/160SC-LS card 19-15
T1 interface card (D/240SC-T1) 19-18
Description 19-18
Limitations 19-18
Switch settings 19-18
Memory range 19-18
Trunk types and supported T1 configurations 19-19
Installing the card 19-21
Activating the D/240SC-T1 card 19-23
Restarting the system 19-25

20 Dial Pulse Detection option 20-1
Introduction. 20-1
DPD Features. 20-1
Country parameters 20-2
User issues. 20-2
Activating the DPD feature 20-3

21 Replacing hardware components 21-1
Overview 21-1
Release 2.x hardware platforms. 21-1
Section A: Tower AP (300tp) and MRS/AP (300tp) 21-2
Overview 21-2
Removing and replacing the chassis cover 21-2
Description 21-2
Requirements. 21-2
Removing the chassis cover 21-3
Replacing the chassis cover 21-5
Replacing the cooling fan 21-6
Description 21-6
Requirements. 21-6
Procedure for removing the cooling fan 21-7
Removing or replacing the air filter. 21-10
Description 21-10
Requirements. 21-10
Procedure for removing or replacing the air filter 21-11
Section B: Tower AP (700tp), MRS/AP (700tp), and MRS/Tower 21-12
Overview 21-12
Removing and replacing the chassis cover 21-13
Description 21-13
Requirements. 21-13
Removing the chassis cover 21-14
Replacing the chassis cover 21-15
Removing or replacing the air filter. 21-16
Description 21-16
Requirements. 21-16
Procedure for removing or replacing the air filter 21-17
Replacing the fan assembly 21-19
Description 21-19
Requirements. 21-19

Procedure for replacing the fan assembly 21-19
Replacing the power supply 21-22
Description 21-22
Requirements 21-22
Procedure for replacing the power supply 21-22
Section C: Rack AP and MRS/Rack 21-26
Overview 21-26
Replacing hot-swappable components 21-26
Using the LED displays 21-27
Removing and replacing the chassis cover 21-28
Description 21-28
Requirements 21-28
Removing the chassis cover 21-28
Replacing the chassis cover 21-29
Removing and replacing the front bezel 21-30
Description 21-30
Requirements 21-30
Removing the front bezel 21-30
Replacing the front bezel 21-31
Removing or replacing air filters 21-32
When to remove or replace 21-32
Locating the air filters 21-32
Requirements 21-32
Removing or replacing the front bezel air filter 21-32
Removing or replacing the door air filter 21-32
Replacing the cooling fan 21-33
When to replace the cooling fan 21-33
Requirements 21-33
Hot-swapping a cooling fan 21-33
Replacing the power supply 21-36
When to replace a power supply 21-36
Requirements 21-36
Hot-swapping a power supply 21-36
Replacing the fuse 21-38
Description 21-38
Requirements 21-38
Procedure for replacing the fuse 21-39
Replacing the display panel and alarm board 21-40
When to replace the display panel or alarm board 21-40
Requirements 21-40
Replacing the display panel 21-40

Replacing the alarm board 21-41

22 Replacing or adding a hard disk or media drive 22-1

Overview 22-1
Number of supported hard disks 22-1
Release 2.x hardware platforms 22-2
Section A: Tower AP (300tp) and MRS/AP (300tp) 22-3
Overview 22-3
Requirements 22-3
Approved hard disks 22-3
Replacing or adding a hard disk or media drive 22-4
Removing the drive bay from the chassis 22-5
Preparing the new drive (jumper settings) 22-7
Hard disk settings 22-8
CD-ROM settings 22-10
Tape drive settings 22-10
Replacing or adding a drive 22-11
Configuring a new hard disk 22-15
Section B: Tower AP (700tp), MRS/AP (700tp), and MRS/Tower 22-16
Overview 22-16
Requirements 22-16
Approved hard disks 22-16
Replacing or adding a hard disk or media drive 22-17
Removing the drive tray from the chassis 22-18
Preparing the new drive (jumper settings) 22-21
Hard disk settings 22-22
CD-ROM settings 22-24
Tape drive settings 22-24
Removing the floppy drive bracket from the drive tray 22-25
Replacing or adding hard disks 1 or 2, the tape drive, or CD-ROM 22-26
Replacing the floppy drive 22-26
Reinstalling the drive tray 22-27
Configuring a new hard disk 22-28
Section C: Rack AP and MRS/Rack 22-29
Overview 22-29
Approved hard disks 22-29
Adding or replacing a hard disk 22-30
Preparing the hard disk 22-30
Hard disk settings 22-31

Installing the hard disk into the appropriate drive bay 22-32
Configuring a new hard disk 22-33
Replacing or adding a floppy drive, tape drive, or CD-ROM 22-34
Requirements 22-34
Preparing the new media drive (jumper settings) 22-34
CD-ROM settings 22-35
Tape drive settings 22-35
Removing the media drive bay from the chassis 22-36
Removing the media drives 22-38
Installing a new drive 22-39
Section D: Configuring a new hard disk 22-40
Overview 22-40
Creating VSN volumes 22-40
Format and partition the hard disk 22-41
Mounting additional hard disks 22-45
Adding an entry to the /etc/default/filesys file 22-45
Clearing the VSN volume 22-47

23 Troubleshooting 23-1
Overview 23-1
Troubleshooting checklists 23-1
System verification 23-10
Boot-up (POST) diagnostics 23-10
Creating an emergency boot diskette 23-10
License file errors 23-11
Viewing the alarm log 23-12
Verifying resource availability (Advisory log) 23-12
Resource information in the Advisory log 23-14
Additional information in the Advisory log 23-15
Solving system-wide problems 23-15
Verifying the system configuration 23-16
Reviewing the transaction event log 23-16
Checking system and process status 23-17
Verifying the communication link 23-19
Using the Auto-Announce mode while system is down 23-22
Gathering call statistics 23-23
Isolating a channel fault 23-25
Error messages 23-25
Using verbose mode 23-25
Testing loopstart channels 23-26
Embedded call-in test (loopstart and T1 lines) 23-29

Testing a T1 span 23-31
Reinitializing a channel 23-33
Modifying the state of an ACD channel 23-34
DOS-based diagnostics and PC Diags 23-35
Running DOS-based diagnostics 23-35
Using PC Diags 23-36
Telco card diagnostics 23-36
D/41ESC or D/160SC-LS card 23-36
D/240SC-T1 or D/320SC card 23-37
SCSISelect utility 23-39
Debugging trunk type files 23-39
Description of IVR tools 23-40

24 Verification test (NTTEST) 24-1

Introduction 24-1
Tests available in NTTEST 24-2
DTMF test (part of NTTEST_MN) 24-2
Record test (part of NTTEST_MN) 24-2
Flash-hook test (part of NTTEST_MN) 24-2
Fax test (NTTEST_Fax) 24-2
Speech Recognition test (NTTEST_SRg) 24-2
Text-to-Speech test (NTTEST_TTS) 24-2
ADSI test (NTTEST_ADSI) 24-2
SNMP test(NTTEST_SNMP) 24-3
SCbus Transfer via Conference test (NTTEST_STC) 24-3
Meridian Route Optimization (NTTEST_MRO) 24-3
Retrieval of DNIS and CLID and Calling Line Category (NTTEST_RET) 24-3
IPML test (NTTEST_IML) 24-4
Dial Pulse Detection (NTTEST_DPD) 24-4
Web Option test (NTTEST_WEB) 24-4
Main menu and submenu choices 24-4
Error handling 24-6
Error voice messages 24-6
Event log 24-6
Prompts used for NTTEST 24-6
Loading and using NTTEST 24-12
Check the results 24-15

Appendix A: Accessing the Service Console Interface A-1

Default SCI account passwords A-1
Using a terminal to access the SCI A-2
Using a modem to access the SCI A-2
Using the LAN to access the SCI A-3
Accessing the SCI on an MRS/AP A-4

Appendix B: Useful system information B-1

Introduction B-1
UNIX commands B-1
ftp command B-3
UNIX editors B-5
Hints on using the UNIX vi editor B-5
Starting nedit and scoedit B-6
File structure B-7
Description of AP software directories and files B-8
Kernel parameters B-10

Appendix C: Installing the cabinet and rack-mountable components C-1

Introduction C-1
Section A: Installation planning and component installation C-2
Introduction C-2
Description C-2
Cooling C-2
Space requirements C-3
Cabinet configuration C-4
Server mounting C-5
Description C-5
Mechanical considerations C-5
Monitor enclosure C-6
Keyboard drawer enclosure C-8
Switch box C-8
Multiple cabinet configurations C-9
Multiple-cabinet component assignments C-10
Safety and reliability C-10
Cabling C-11
Slack requirements C-11
Secure cables C-11

Cabinet component expansion C-11
Server expansion C-11
Equipment handling C-12
Guidelines C-12
Power and grounding guidelines C-13
Safety information C-13
Safety ground and logic return wiring in all cabinets C-13
Guidelines on daisy-chaining ground wires in AC and DC cabinets C-14
DC wire gauge tables C-15
Overview C-15
Section B: Installing the cabinet C-18
Positioning and leveling the cabinet C-18
Overview C-18
Procedure for installing a cabinet C-18
Requirements C-18
Installing seismic kit or stabilizing rods (if required for site) C-19
Removing a cabinet door C-19
Positioning and leveling the cabinet C-19
What's next? C-20
Installing power and ground in a cabinet C-20
Before you begin C-20
Tools required C-21
Pre-installation tasks C-21
The Power Distribution Unit C-22
Overview C-22
Modems C-23
Description C-23
Multiple PDUs C-25
DC Power input C-27
Install the PDU C-27
Power cords and ground wire (no UPS) C-27
Bring power and ground into cabinet terminal block C-28
Introduction C-28
Installing DC power and ground C-28
Telescoping slide rails C-29
Overview C-29
Description C-29
Requirements C-30
Installing slide rails for the server C-30

Glossary **Glossary-1**

Index **Index-1**

About this guide

Purpose of this manual

The *Symposium OPEN IVR 4.0 Installation, Upgrade, and Maintenance Guide* is designed to aid the person responsible for

- installing and maintaining the OPEN IVR 4.0 hardware
- upgrading Nortel OPEN IVR 2.x systems to Symposium OPEN IVR 4.0

This manual provides step-by-step instructions to install the equipment, and technical information on the components of the system, as well as information required for upgrading your current OPEN IVR system to Symposium OPEN IVR 4.0.

This guide is intended to be used by the installer at installation time and also by the technician for maintaining the hardware and software during the lifetime of the equipment.

Prerequisites

This guide assumes the user has the following skills:

- expertise in installing computer hardware systems
- expertise in repairing computer hardware systems and components (replacing boards and components)
- knowledge of windowing environments and DOS/UNIX software
- expertise with diagnostic tools (loopstart or T1 diagnostic equipment, VOM, butt set, breakout box, datascope)
- experience on basic telephone switching circuits (telephone wiring, CO and PBX switching circuits)
- basic data communications skills (protocols, signaling, hardware components)
- basic computer troubleshooting skills

Document organization

This guide is organized in the following manner:

- Chapter 1, “Product overview,” provides information relating to the Symposium OPEN IVR hardware and software components.
- Chapter 2, “Before you begin,” provides important information you should know before installing or performing maintenance on your system.
- Chapter 3, “Tower AP (300tp) installation,” provides information required to install your AP.
- Chapter 4, “MRS/AP (300tp) installation,” provides information required to install an MRS/AP system.
- Chapter 5, “Tower AP (700tp) and Rack AP installation,” provides information required to install your AP.
- Chapter 6, “MRS/AP (700tp) installation,” provides information required to install an MRS/AP system.
- Chapter 7, “MRS/Tower installation,” provides information required to install an MRS/Tower.

- Chapter 8, “MRS/Rack installation,” provides information required to install an MRS/Rack.
- Chapter 9, “Uninterruptible Power Source (UPS) option,” contains information about the optional UPS, including installation information.
- Chapter 10, “AP redundancy and replacing an AP or MRS/AP,” describes the procedure for adding an additional AP to your system for redundancy. If your primary AP fails, the secondary, or redundant AP, takes control.
- Chapter 11, “Remote access,” discusses supported modems and methods of accessing your OPEN IVR system from a remote location.
- Chapter 12, “Replacing or adding an MRS,” provides information required to replace or add an MRS to your OPEN IVR system.
- Chapter 13, “Host name and IP address change,” describes the host files (which name the other nodes in the network) and default network configurations, and how to change the IP address and node name of an AP, MRS, or MRS/AP.
- Chapter 14, “Upgrade procedures,” provides the information and procedures required to upgrade your current OPEN IVR system to Symposium OPEN IVR 4.0. Also included are the procedures required to update your applications so they are compatible with the new software.
- Chapter 15, “Backup and failure recovery,” contains information required to back up and restore your Symposium OPEN IVR 4.0 system. Also in this chapter is the procedure for restoring your system in case of upgrade failure.
- Chapter 16, “Disk Mirroring option,” describes the Disk Mirroring option and provides information on replacing a defective root or parity disk.
- Chapter 17, “LAN card installation,” describes installing and configuring LAN cards in a Symposium OPEN IVR 4.0 system.
- Chapter 18, “SBC card and SIMMs installation,” describes how to replace and upgrade the SBC card, add SIMMs, and upgrade the BIOS.
- Chapter 19, “Telco interface card installation,” includes information on SC Bus cabling rules, slot assignment rules, card descriptions, cabling rules, and installation.

- Chapter 20, “Dial Pulse Detection option,” provides information on the Dial Pulse Detection (DPD) feature. DPD is available via special downloadable firmware onto the following Dialogic boards:
  - — D/41ESC (specially enabled for DPD)
  - — D/160SC-LS-IDPD
  - — D/320SC-IDPD
- Chapter 21, “Replacing hardware components,” describes how to replace hardware components such as cooling fans, power supplies, and air filters.
- Chapter 22, “Replacing or adding a hard disk or media drive,” describes the steps for replacing or adding a hard disk or media drive (floppy, tape, or CD-ROM drive).
- Chapter 23, “Troubleshooting,” provides information about the diagnostic facilities provided for troubleshooting your system.
- Chapter 24, “Verification test (NTTEST),” describes how to use the NTTEST_MN system test application.
- Appendix A, “Accessing the Service Console Interface,” provides information required to access the Service Console Interface (SCI).
- Appendix B, “Useful system information,” provides useful UNIX information, including vi editor, that may be required to install, upgrade, or maintain your system.
- Appendix C, “Installing the cabinet and rack-mountable components,” provides information on installing a cabinet to hold your Symposium OPEN IVR hardware components.

Supporting Release 4.0 documentation

Additional information about Symposium OPEN IVR 4.0 is presented in the following Release 4.0 documentation:

Document	NT number/ A0 number/ P0 number
Symposium OPEN IVR 4.0 Getting Started Guide	NTVE8201 A0732100 P0881271
Symposium OPEN IVR 4.0 Product Guide	NTVE8202 A0732101 P0881273
Symposium OPEN IVR 4.0 System Administration Guide	NTVE8203 A0732102 P0881274
Symposium OPEN IVR 4.0 Application Development Guide	NTVE8209 A0732108 P0881275
Symposium OPEN IVR 4.0 Cell Catalog	NTVE8208 A0732107 P0881276
Symposium OPEN IVR 4.0 Installation, Upgrade, and Maintenance Guide	NTVE8204 A0732103 P0881277
Symposium OPEN IVR Planning and Engineering Guide	NTVE8205 A0732104 P0881278
Symposium OPEN IVR 4.0 Error Messages Guide	NTVE8206 A0732105 P0881279

Symposium OPEN IVR 4.0 Web Option Guide	NTVE8210 A0732109 P0881281
Symposium OPEN IVR 4.0 SQL Server User Guide	NTVE8216 A0732115 P0881282
Symposium OPEN IVR 4.0 Service Console Interface Reference Manual	NTVE8207 A0732106 P0881284
Symposium OPEN IVR 4.0 VT100 Host Connectivity Configuration and Development Guide	NTVE8221 A0732120 P0881286
Symposium OPEN IVR 4.0 Text-to-Speech Option Guide	NTVE8213 A0732112 P0881292
Symposium OPEN IVR 4.0 Speech Recognition Option Guide	NTVE8212 A0732111 P0881293
Symposium OPEN IVR 4.0 Fax Option Guide	NTVE8211 A0732110 P0881294
Symposium OPEN IVR 4.0 CAS and ISDN Signaling Option Guide	NTVE8214 A0732113 P0881296
Symposium OPEN IVR 4.0 Integration Package for Meridian Link User Guide	P0881297 NTVE8215 A0732114
Symposium OPEN IVR 4.0 Prompt Import Utility Guide	NTVE8218 A0732117 P0881400
Symposium OPEN IVR 4.0 SNA Host Communications Guide	NTVE8227 A0732774 P0881750

Conventions used in this guide

Throughout this guide, several typographic conventions have been used to highlight certain types of information:

- Items that appear on the Symposium OPEN IVR 4.0 screens are identified in quotes, for example:
  the “Timeout” part of the Parameters window
- Field names, prompts, file and menu names, directories, accounts and options are shown in a different typeface, for example:
  `/sci>`
  `sci/install` menu
  `/u/nortel/3270/getbalance.act` file
- Symposium OPEN IVR 4.0 buffer names are shown in all uppercase characters, for example:
  the CURRENT MESSAGE buffer
- Items you must type are shown in bold in a different typeface, for example:
  at the prompt, type **`tn5250`**
- Variables shown in command lines appear in italics, for example:
  the `host_cfg`*n* file, where *n* is a variable representing a board number
- Key names you press are shown in angled brackets, for example:
  the <F1> key
- Keyboards usually have keys named <Return> or <Enter> that perform the same function. For convenience, this guide uses the keyname <Enter> to represent both keynames.

Chapter 1: Product overview

Introduction

The Symposium OPEN IVR 4.0 product family is a portfolio of switch-independent, feature-rich, Interactive Voice Response (IVR) products. Voice response gives callers access to information through the telephone using DTMF and speech recognition.

With IVR, the caller can interact with online host computers and databases. For example, a caller could

- retrieve up-to-date account information from their bank
- inquire about the status of policies from their insurance company
- make inquiries about travel reservations from an airline
- register for a course at their local college

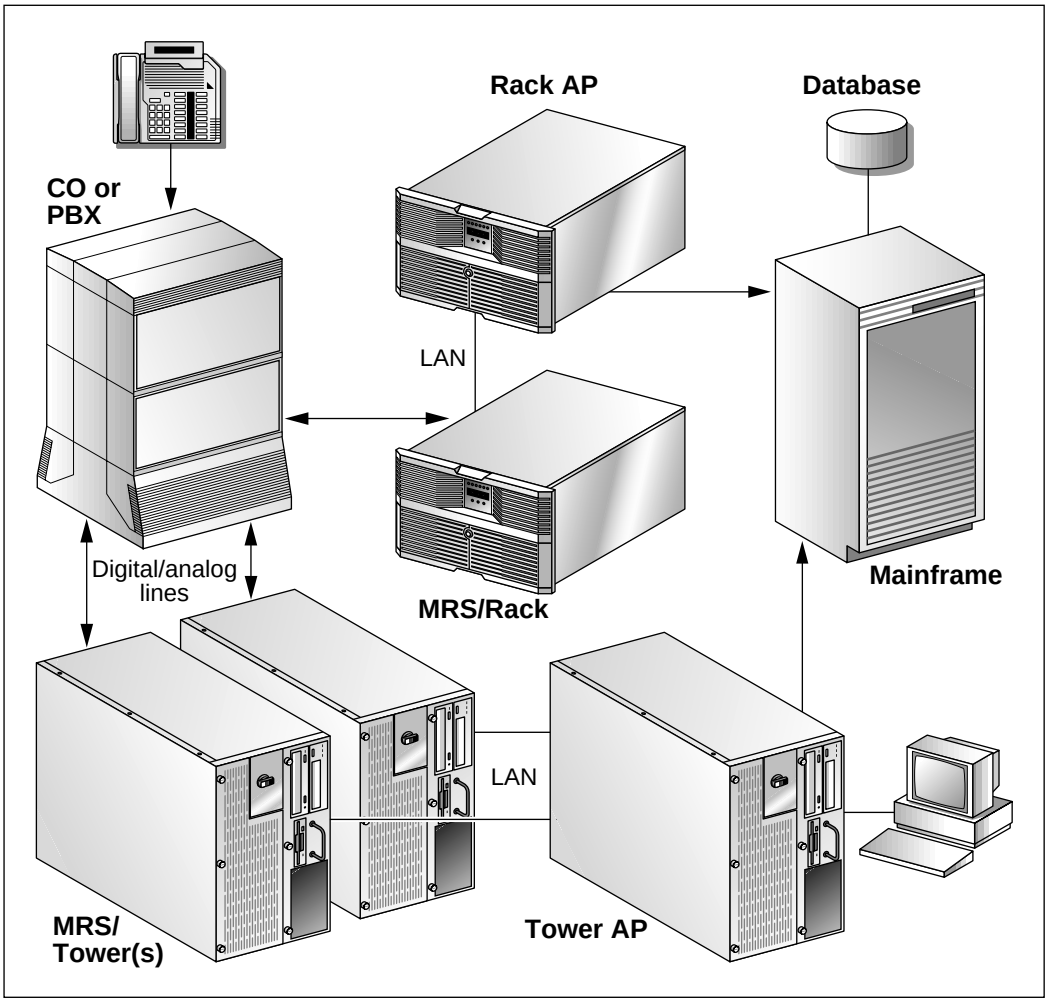
System components

The Release 4.0 system architecture combines one or more Multimedia Resource Servers (MRS) with a general-purpose Application Processor (AP) to provide a versatile application development or run-time environment, or both. In this architecture, the MRS provides the telephony, information processing environment (for example, voice, fax, speech recognition, text-to-speech), and the network interfaces. The AP provides the environment for developing and managing/controlling the IVR applications.

A node consists of at least one AP and one MRS, or a single MRS/AP.

One node supports a maximum of four MRSs and two APs (a primary AP and a redundant AP).

Figure 1-1: OPEN IVR system components



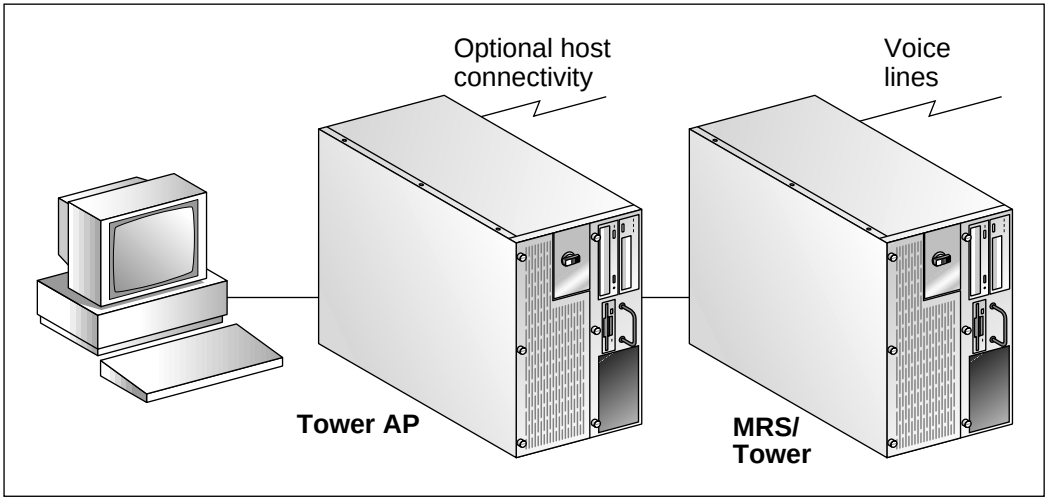
Hardware components

The Symposium OPEN IVR 4.0 product consists of the following three hardware configurations.

Tower AP with one or more MRS/Towers

The MRS/Tower interfaces with the Application Processor (Tower AP) via either Ethernet or Token Ring, as shown in Figure 1-2.

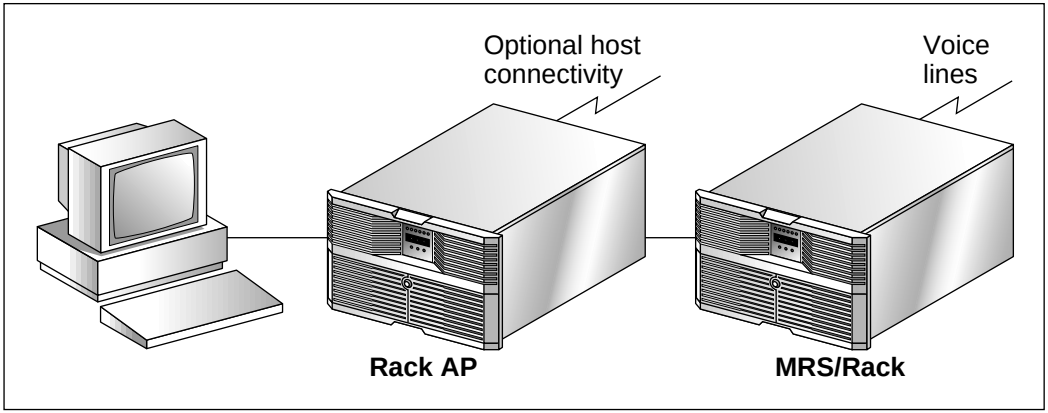
Figure 1-2: Tower AP with MRS/Tower



Rack AP with one or more MRS/Racks

The MRS/Rack interfaces with a rack-mountable Application Processor (Rack AP) via either Ethernet or Token Ring, as shown in Figure 1-3. The MRS/Rack and the Rack AP are each packaged in a rack-mountable chassis that can be installed in a 19-inch cabinet or frame and can be purchased in either an AC or a DC version.

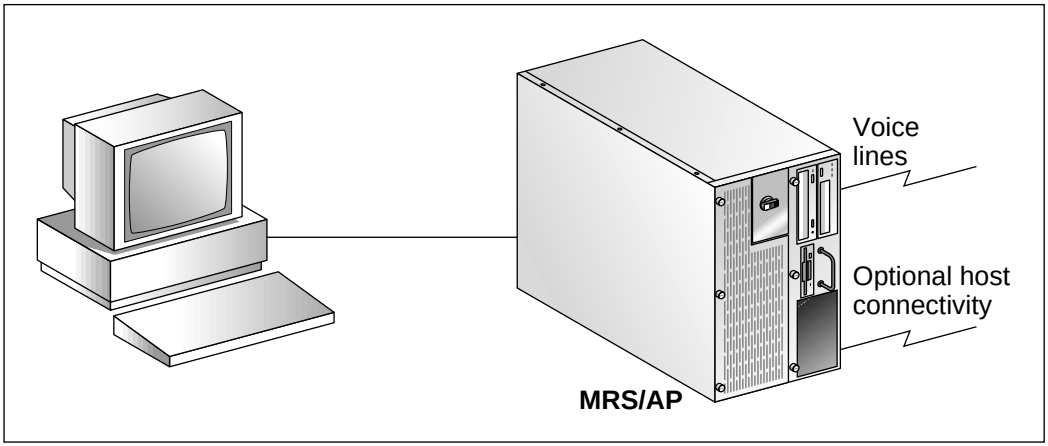
Figure 1-3: Rack AP with MRS/Rack



An MRS/AP

The MRS/AP, shown in Figure 1-4, is a single unit that runs a “folded” configuration (that is, a single unit that includes both the MRS and the AP functionality). The MRS/AP contains the functionality of the other platforms, but in a single hardware unit.

Figure 1-4: MRS/AP



Software

The OPEN IVR Release 4.0 software runs under the SCO OpenServer Release 5.0.4 software. Development systems require the SCO Open Server Development 5.0.4 system.

The OPEN IVR AP software provides the application development or run-time environment, or both, on the AP and the combined MRS/AP.

The OPEN IVR MRS software controls the telephony, information processing, and network connectivity resources on the MRS.

System security

The Symposium OPEN IVR 4.0 system uses a license file and a License Manager security keylock to provide security for its base software and options. The License Manager checks the keylock for an ID string that matches the ID in the license file.

The license file contains “keys” for the options you purchased. If you change your system configuration, or purchase additional MRSs or features, a new license file is required. For information regarding the software License Manager, refer to the *Symposium OPEN IVR Service Console Interface Reference Manual*.

Chapter 2: Before you begin

Introduction

This chapter provides important information useful in preparing to install, upgrade, or maintain an AP, MRS, or MRS/AP.

If you need to replace or upgrade any system parts, follow the tools and safety guidelines. Following Nortel's safety precautions can prevent personal injury and damage to the server or replacement parts.

CAUTION

Risk of damage

Field maintenance should always be performed by fully qualified, trained personnel.

Keycodes and certificates

If a Development Symposium OPEN IVR 4.0 system was purchased, you should have received a SCO Development license keycode and certificate. Retain the SCO Development keycode and certificate for future use, and store in a safe place. For easy reference, please enter the SCO Development license keycode on the following lines for each AP or MRS/AP that is licensed for development.

SCO Development License (one for each Development AP or MRS/AP):

1) _____

2) _____

If the Disk Mirroring option was purchased, also retain the Disk Mirroring serial number and certificate for future use, and store in a safe place. For easy reference, please enter the Disk Mirroring serial number on the following lines for each server that has Disk Mirroring.

Disk Mirroring serial number (one for each server with Disk Mirroring):

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

Accounts and passwords

Symposium OPEN IVR 4.0 systems have several user IDs and accounts. Each user ID and account has different access abilities. All user ID and account passwords are summarized in the following table.

Table 2-1: Accounts and passwords

AP		MRS/AP		MRS/Rack or MRS/Tower	
User ID	**Password**	**User ID**	**Password**	**User ID**	**Password**
		user	user1	user	user1
		admin	admin1	admin	admin1
		service	service1	service	service1
nortel	nortel1	nortel	nortel1		
nppp	nppp1	nppp	nppp1	nppp	nppp1
root	root1	root	root1	root	root1

Note 1: The account “nppp” is used only for remote access connections using PPP.

Note 2: To access the SCI on an MRS/AP, press Ctrl-Alt-F1 to access the command-line interface. Then use the user IDs and passwords listed for the MRS/Rack or MRS/Tower.

Safety precautions

Introduction

Before you install or perform maintenance on an AP, MRS, or MRS/AP, you should take safety precautions to avoid damage or injury to you and the server. Any precautions made now will make the tasks of installing or maintaining the server much easier.

General safety

Nortel recommends that you observe these safety guidelines as you work on your server:

- Plug the system and peripheral devices into properly grounded power sources to prevent electric shock.
- Use a surge protector or uninterruptible power supply to protect your system from sudden increases and decreases in electrical power.
- Ensure nothing rests on your system's cables, and cables will not be tripped over or stepped on.
- Do not spill food or liquid on the system.

Avoiding electrostatic discharge

Electrostatic discharge (ESD) can damage diskette drives, cards, ECC memory modules, and CPU modules. We recommend that you perform all installation and maintenance procedures on your IVR system while wearing an antistatic wrist strap. Ground the ESD wrist strap by attaching it to any unpainted metal surface on your system chassis.

Motherboards and cards are extremely sensitive to ESD. Attach the ESD wrist strap before removing a card from its protective wrapper or from the system. After removing a card from its protective wrapper or from the system, place it component-side up on a conductive foam pad, if possible.

CAUTION

Risk of equipment damage

Do not place a motherboard or a card down on its packaging wrapper.

Do not slide a motherboard or a card over any surface.

Precautions for handling component cards

These precautions are recommended for any procedure that includes adding or removing a card:

- After removing a card from its protective wrapper or from the system, place it component-side up on a grounded, static-free surface.
- Do not slide a card over any surface.
- Do not touch card components or gold-edge connectors on the card.
- Hold a card by the top edge or side edges only.

Installing cards

When installing cards, remember the following:

- The backplane is flexible and supported with stand-offs.
- Card slots resist connector insertion. Applying a firm, steady force seats a card in its slot properly. (Cards seat with friction followed by a solid stop.)
- External connector plates, attached to cards, are seated in the rear panel and secured with a screw.

Site safety

To keep the site as safe as possible, follow these tips:

- keep the area clean and clear of debris
- provide adequate space for all equipment
- provide adequate room around the equipment for adequate airflow and ventilation
- place equipment well away from external heat sources
- provide adequate space for access to the front, side, and rear panels of the hardware
- isolate the area from strong electromagnetic fields and electrical noise sources including:
  - air conditioners
  - large fans
  - motors
  - radio or TV transmitters
  - high-frequency security devices
- provide adequate grounded electrical outlets or power bars for all equipment. You should have one outlet for each
  - system unit
  - monitor
  - modem power cord
  - LAN hub power cord

Safety precautions used when installing or replacing hardware components

Observe these safety guidelines before removing the side cover of your server:

1 Turn off all peripheral devices connected to the server.

2 Turn off the system by using the push-button on/off power switch. Unplug the AC power cord from the system or wall outlet.

3 Label and disconnect all peripheral cables and all telecommunication lines connected to the I/O connectors or ports on the back of the system.

Cooling and airflow

For proper cooling and airflow, always install the chassis side cover before turning on the system. Operating the system without the cover in place can damage system parts.

Installation and maintenance tools

Introduction

When installing or maintaining a system component, you need some specific tools.

Remember to follow all recommended safety precautions.

Tools required

To perform installation or maintenance activities, gather the following tools:

- antistatic ESD wrist strap (recommended)
- Phillips (cross-head) screwdriver
- standard (slot-head) screwdriver (1/4 inch and 1/2 inch)
- jumper removal tool or needle-nosed pliers
- tweezers
- pen or pencil for noting cable lengths and labelling cables
- cable tie-wraps
- cable identification labels
- tape measure for determining cable lengths

Approved replacement parts

Before replacing any parts on your server, contact your Nortel sales representative or dealer for a list of approved add-in boards and peripheral devices. Using non-approved replacement parts may cause serious system problems and will void your Nortel warranty.

Shutting down the AP or MRS/AP

Before powering down the AP or MRS/AP, always issue the shutdown command.

Note: The user `root` can always issue the shutdown command.

To shut down the AP or MRS/AP as the user `root`:

1. Press <CTRL>+<ALT>+<F1> to go the main console.
2. Log in to the AP or MRS/AP as root.
3. Enter the root password.
4. At the # prompt, type **`shutdown -y -g0`** and press <Enter>.

   The AP or MRS/AP begins to shut down. After the shutdown process is complete, the following lines are displayed:

   ```
   ** Safe to Power Off **

           - or -

   ** Press Any Key to Reboot **
   ```

5. Do one of the following substeps:

   a If the maintenance procedure requires that you power off the system, turn off the power to the AP or MRS/AP.

   or

   b If the maintenance procedure requires that you reboot the system, press <Enter> to reboot.

Shutting down the MRS

CAUTION

Risk of losing data

Do not power off the MRS without first performing the following procedure. Otherwise, corruption of the UNIX file system may occur.

Shutting down the system places the MRS in a state where the system power can be turned off. The shutdown process flushes all files to disk and gracefully terminates all remote TCP sessions.

When the shutdown process begins, the MRS sends a reply to the application processor notifying it that the shutdown process has been started and the MRS has been taken out of service.

You can shut down the MRS using the following methods:

1 using the SCI program from a local or remote connection (on Release 2.x or Release 4.0 MRS hardware platforms); see “Shutting down the MRS through the SCI (remotely or locally)” on page 2-9

2 the shutdown switch on the front panel (on Release 2.x MRS hardware platforms only); see “Shutting down the MRS with the shutdown switch (Release 2.x MRS)” on page 2-10

Shutting down the MRS through the SCI (remotely or locally)

You can log in to the SCI using:

- a local terminal connected to the MRS or MRS/AP
- a remote terminal and modem connection
- telnet from the AP console

Shutting down the system from a remote terminal or the AP console is particularly useful when

- physical access to the MRS is not possible (no terminal attached to the tower)
- the system is not in normal operating mode (that is, the Ready indicator is flashing)

Table 2-2: Accessing the SCI

Method of logging in to the SCI	See the following procedure
from a local terminal connected to the MRS	see “Using a terminal to access the SCI” on page A-2
from a local terminal connected to an MRS/AP	see “Accessing the SCI on an MRS/AP” on page A-4
from a remote terminal	see “Remote login to the SCI” on page 11-6
from the AP console over the LAN	see “Using the LAN to access the SCI” on page A-3

Once you have established connection with the MRS and can see a login prompt, follow these steps:

1 Log in to the MRS or MRS/AP as `service`. When prompted for the password, type the password and press <Enter>.

2 The system prompts you for your terminal type. If the default terminal type displayed is correct, press <Enter>; otherwise, type in the correct terminal type (for example, VT100 or ANSI).

Once this is completed, the SCI main menu is displayed.

3 At the `/sci>` prompt, type **`maint`** and press <Enter>.

4 At the /sci/maint> prompt, do one of the following substeps:

a To shut down and power off the MRS, type **shutdown** at the /sci/maint> prompt and press <Enter>. After the shutdown process is complete, the following lines are displayed:

```
** Safe to Power Off **

        - or -

** Press Any Key to Reboot **
```

Turn off the MRS.

b To reboot the MRS, type **restart** at the /sci/maint> prompt and press <Enter>. After the shutdown process is complete, the MRS automatically reboots.

Shutting down the MRS with the shutdown switch (Release 2.x MRS)

To shut down a Release 2.x MRS hardware platform using the shutdown switch, follow these steps.

1 Check the state of the Ready indicator on the front panel. If the Ready indicator is on, the system is in normal operational mode (even if the Major Alarm light is on) and the MRS can be shut down. If the Ready indicator is off, the system is already shut down. If the Ready indicator is flashing, the MRS is currently booting up, resetting, or already in the process of shutting down. Wait until the Ready indicator is on to continue with this procedure; otherwise, refer to the next procedure on shutting down the system via the dial-up modem.

2 Press and hold (10 to 20 seconds) the shutdown switch located on the front panel until the Ready indicator begins flashing, indicating that the shutdown process is occurring.

Note: In some situations while you are holding the shutdown switch, the Major Alarm indicator may light momentarily before the Ready indicator begins flashing. This is not an error condition.

3 Once the shutdown is complete, the Ready indicator turns on and, within a few seconds, the Major Alarm indicator turns on. Now the system is fully shut down and may be powered off by pressing the power switch on the front panel.

Changing the system date

To change the system date, follow these steps.

1. Log in as `root`.
2. At the # prompt, type **`date`** *`mmddhhmmyy`* (where `mm` is the month, `dd` is the day, `hh` is the hour, `mm` is the minute, and `yy` is the year) and press <Enter>.

   For example, for January 20, 1998 at 3pm, type **`date 0120150098`** and press <Enter>.

Changing the system time zone

To change the system time zone, follow these steps.

1. Log in as `root`.
2. At the # prompt, type **`tz`** and press <Enter>.
3. Answer the questions that appear on the display.

   The time zone change is effective after the next reboot.

Chapter 3: Tower AP (300tp) installation

Introduction

At the customer site, installation is coordinated with the customer, the distributor responsible for the installation, and any local contractors required for wiring phone lines, power, and data cables to the incoming system.

A summary of the installation process is included in the installation procedures. An experienced IVR installer can use this installation summary and refer to the detail on the following pages when needed.

> ***Note:*** If you are installing an MRS/AP, proceed to Chapter 4, "MRS/AP (300tp) installation."

Steps for physical installation of the system

Installation roadmap

To install the Tower AP, complete the steps in the following roadmap:

Installation roadmap		
Step	**What to do**	**How to do it**
1	Remove the AP and peripherals from the packaging.	"Removing components from packaging" on page 3-3.
2	Verify that you have all of the necessary components for the installation.	"Checklist — necessary components for the installation" on page 3-3.
3	Remove the cover from the AP.	"Removing the chassis cover of the AP" on page 3-4.

Installation roadmap		
Step	**What to do**	**How to do it**
4	Check to make sure that all cards, boards, and cable connectors are seated properly.	“Inspecting the chassis” on page 3-5.
5	Remove the drive bay shipping bracket on the AP.	“Removing the drive bay shipping bracket” on page 3-6.
6	Install host connectivity hardware (if it was ordered and received separately).	For the 3270/5250 Token Ring or SDLC board, refer to the *Symposium OPEN IVR SNA Host Communication Guide* (P0881750). For the VT100 board, refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* (P0881286).
7	Replace the AP cover.	“Replacing the AP cover” on page 3-9.
8	Connect devices to the backplane: • mouse • keyboard • monitor • License Manager security keylock	“Connecting peripherals” on page 3-9.
9	Add the external modem.	“Adding a modem for Remote Access Service (RAS)” on page 3-11.
10	Connect the AP to the LAN.	“Connecting to the LAN” on page 3-11.
11	Connect the UPS cable to the AP.	“Connecting the UPS cable” on page 3-12.
12	Power up the system.	“Powering up the system” on page 3-12.
13	Verify, test, and configure host communication options.	“Verify host connectivity options” on page 3-14.
14	Check the license file.	“Checking the license file” on page 3-14
15	Perform final steps.	“Final installation steps” on page 3-14.

Removing components from packaging

When removing the AP, optional hardware, and peripherals from the shipping cartons, use the checklist below to confirm that you have received everything required to install your system.

Place the monitor and optional UPS in the preplanned location and continue with the steps to install the AP.

Checklist — necessary components for the installation

Before you begin, make sure that you have all hardware components necessary for installing your AP. Use the following checklist as a guide.

Component checklist	✔
Base system	
Application Processor (AP)	
AP power cable	
Monitor	
Monitor power cable and cable to connect monitor to the AP	
Keyboard and keyboard cable	
Mouse	
License Manager security keylock	
Keys	
U.S. Robotics Sportster 33.6 Kbps external modem (North America and some Caribbean and Latin American countries only)	
Modem cables	
System options	
Uninterruptible Power Source (UPS)	
Cable to connect UPS to the AP	
Host connectivity cards and cables	

Component checklist	✔
LAN cards and cables	
Software options	
System software on CD-ROM (not required for installation, but store in a safe place)	

Removing the chassis cover of the AP

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Requirements for removing the AP chassis cover

Before removing the cover, you need a chassis key.

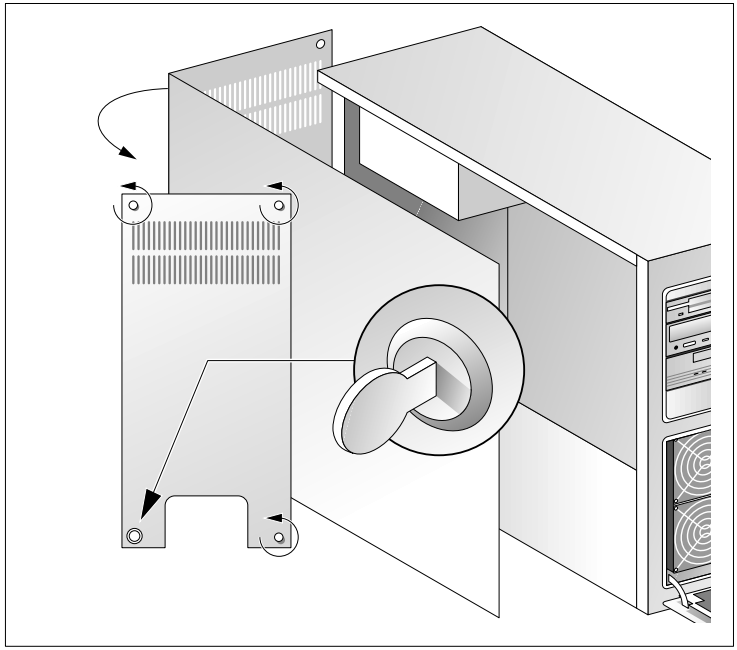
Removing the chassis cover

To remove the chassis cover, follow these steps.

1. If the AP is powered on, shut the AP down and then power down the AP. To shut down the AP, at the `root` prompt type **`shutdown -y -g0`** and press <Enter>. (For more information on shutting down the AP, see “Shutting down the AP or MRS/AP” on page 2-7.)
2. Disconnect the power cord from the power outlet.
3. Move the system so there is a minimum of four feet of unencumbered space at the rear of the chassis.

4 Obtain the chassis key from the customer, and unlock the chassis cover.

Figure 3-1: Removing the chassis cover



5 Loosen the three thumbscrews located at the rear of the chassis.

6 Slide the cover toward the rear of the chassis until it is free.

7 Disconnect the power cable from the AP.

Inspecting the chassis

Introduction

To ensure that the system components are connected properly, you should perform a visual check for loose boards or foreign matter in the chassis. Be sure to inspect the chassis before you continue with the installation.

Inspecting the chassis

Note: Follow these steps to inspect the chassis. If any options were not pre-installed, this would be the appropriate time to install them.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1. Remove the chassis cover as described in this chapter.
2. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
3. Remove the card retaining arm.
4. Carefully check all cards to ensure they are fully seated on the baseboard.
5. Check for any loose wires or foreign objects, such as loose screws, inside the chassis.
6. Replace the card retaining arm.
7. Before you reinstall the cover, go to the procedure “Removing the drive bay shipping bracket” on page 3-6.

   Note: If you have received host connectivity hardware not installed at the factory, go to “Installing host connectivity options not pre-installed” on page 3-8 before reinstalling and securing the cover.

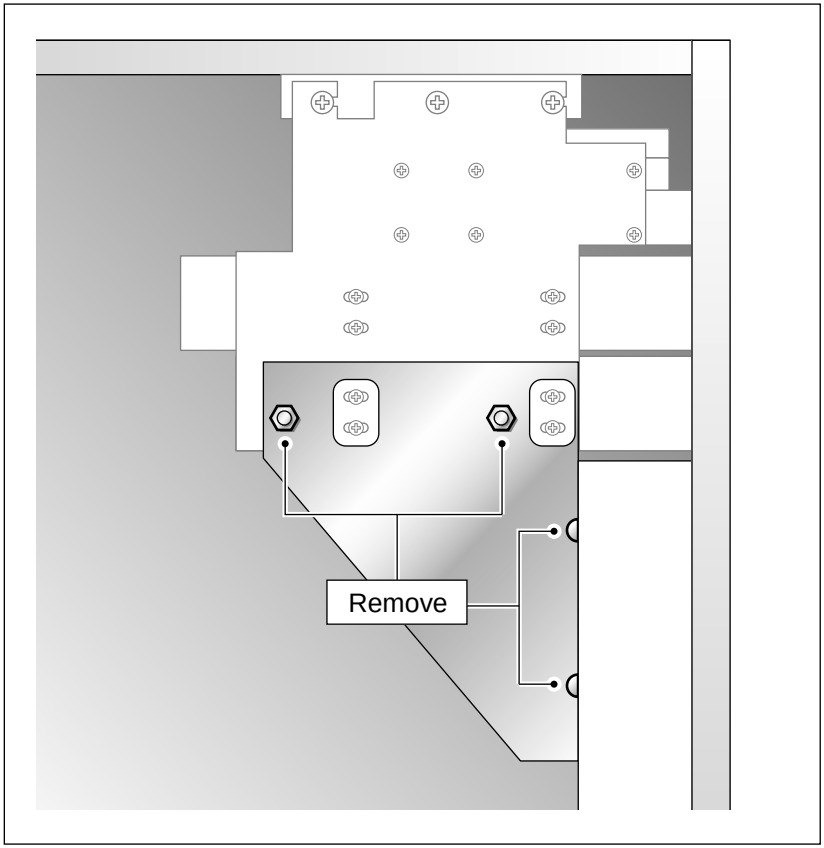
Removing the drive bay shipping bracket

Description

A triangle-shaped bracket is secured to the drive bay and the underframe of the chassis for shipping.

The bracket is used to provide added stability for the drive bay during shipping, and must be removed at the customer site before installing the system.

Figure 3-2: Removing the drive bay shipping bracket



Gathering the tools

Before removing the shipping bracket, gather the following tools:

- nut drivers
- one Phillips-head screwdriver

Removing the drive bay shipping bracket

To remove the shipping bracket, follow these steps.

1 Remove the chassis cover if you have not already done so.

2 Locate the triangular-shaped bracket joined to the drive bay and the underframe of the chassis.

3 Remove the two nuts securing the bracket to the drive bay and the two screws securing the bracket to the chassis.

4 Lift the bracket out of the chassis.

5 Replace the nuts on the drive bay and the screws on the fan housing for safe storage.

6 Replace the chassis cover.

7 Save the bracket in case the system needs to be shipped in the future.

Installing host connectivity options not pre-installed

Refer to the following two guides to install the host connectivity hardware.

To install the	Refer to
3270/5250 Token Ring or SDLC board	*Symposium OPEN IVR SNA Host Communications Guide*
VT100 board	*Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide*

Replacing the AP cover

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Replacing the AP chassis cover

To replace the chassis cover, follow these steps.

1. Align the cover with the chassis so that the contoured lip at the top of the cover fits under the chassis, and the curved lip at the bottom of the cover fits over the chassis.
2. Slide the cover toward the front of the chassis until it fits smoothly and securely with the chassis.
3. Lock the cover at the rear of the chassis with the chassis key.

Connecting peripherals

Introduction

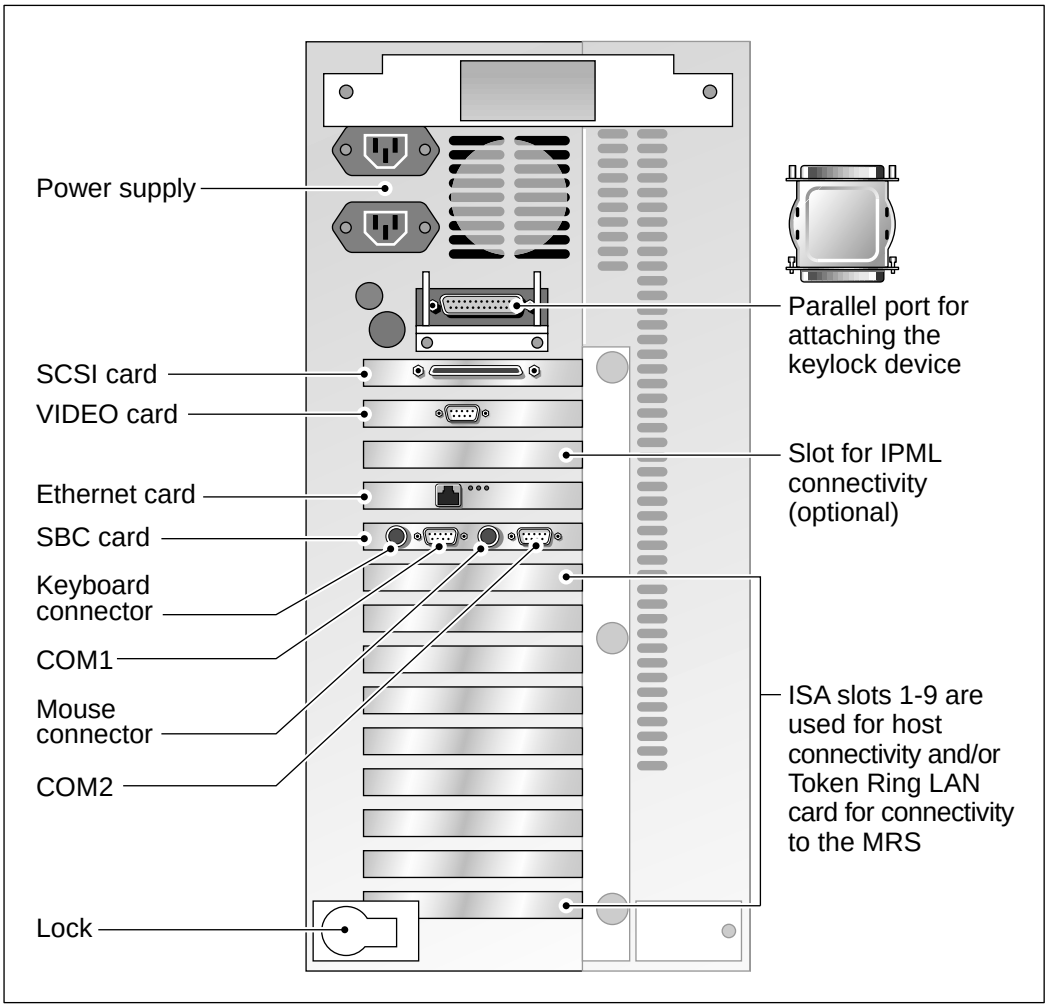
You will need to add peripheral devices to your AP. This procedure aids in installing the mouse, keyboard, License Manager security keylock, and monitor.

Note: Symposium OPEN IVR 4.0 only supports network printers. Printer configuration is a UNIX procedure and is independent of Symposium OPEN IVR 4.0.

Before you begin

A legend is located adjacent to the peripheral connector panel at the back of the AP. This legend shows the symbol for each peripheral and which connector to use.

Figure 3-3: Rear panel connections on the AP



Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then Ethernet cards are optional depending on your system requirements.

Other peripheral devices

You should not add other peripheral devices to your AP. Other peripherals are not supported by Nortel.

Connecting peripheral devices

To connect peripherals and the power cord to the AP, follow these steps.

1. Ensure the machine is not plugged into a power source.
2. Plug the keyboard connector into the keyboard DIN connector at the rear of the chassis.
3. Plug the mouse connector into the PS/2 connector. Check the legend for correct connections.
4. Connect the License Manager security keylock. The security keylock is labeled to indicate the corresponding server.
5. Plug in the monitor connector. Tighten the screws on the connector.
6. Plug the monitor power cord into a wall receptacle or power bar. Do not turn on the monitor at this time.

   Note: *Do not* turn the AP on at this time.

Adding a modem for Remote Access Service (RAS)

When you add a modem to your AP, you can access the AP by a remote service PC. RAS enables you to perform many activities remotely, including maintenance and diagnostics. RAS is required for Nortel support.

For modem installation instructions, see Chapter 11, "Remote access."

Connecting to the LAN

Connect the LAN cable. For information on connecting the AP to the LAN, see Chapter 17, "LAN card installation."

For information on connecting host connectivity options hardware to the host, refer to your Symposium OPEN IVR host connectivity documentation.

Connecting the UPS cable

If the UPS was ordered for your system, connect the UPS computer interface cable from the Computer Interface Port (DB9 connector) on the rear panel of the UPS to COM port 2 on the AP. For more information on the UPS and its installation, refer to Chapter 9, "Uninterruptible Power Source (UPS) option."

Powering up the system

Connecting the AP to the AC power source

To connect the AP to the AC power source, follow these steps.

1 Check the AC grounding receptacle power source for the power properties.

- **a** Using a voltmeter, check the voltage from the ground to the primary lead. You should obtain the standard input voltage.
- **b** Using a voltmeter, check the voltage from the ground to the neutral lead. The reading should be .5 volts or less.
- **c** Using an ohmmeter, verify the resistance from the ground to neutral. The reading should be less than .25 ohms.

2 Connect the AP to an isolated grounding receptacle power source.

- **a** Attach the power cable to the power inlet on the rear of the AP.
- **b** Plug the other end of the power cable into the wall outlet or the optional UPS.
- **c** If the AP powers up when it is plugged in, turn the AP off.
- **d** Use tie-wraps to secure the cables to the AP chassis, if possible. Doing this helps the AP cable connections to remain stable if the AP is moved.

3 If the UPS was ordered, follow these steps.

- **a** Turn on the UPS. Press the On/Test button for one second.

  The UPS will beep and then perform a self-test. The UPS simulates a blackout and switches to on-battery operation. This is the SELF TEST feature which ensures that the UPS is working properly and that its battery does not need replacing. This test will last another 8 to 10 seconds and completes when the On Line light stops flashing.

b Check that the Site Wire Fault Indicator on the rear panel of the UPS is *not* lit. If it is lit, notify the site administrator that a qualified electrician needs to check the outlet for incorrect grounding (for example, voltage potential exists between the neutral and the ground wire).

Turning on the AP

1 If your AP is connected to an optional UPS, make sure that the UPS power is turned on before you turn on the AP.

2 Turn on the AP monitor by pressing the monitor power switch.

3 Turn on the AP by pressing the AP power switch.

4 A Keyboard Detected and a Mouse Detected message should appear on the display when the AP senses these devices. If they do not, power off and check the connections of these devices.

5 A SCSI ID #0 Seagate, a SCSI ID #2 Seagate or Pryhon, and a SCSI ID #5 TEAC message should appear on the display when the AP senses the hard disk, tape drive, and CD-ROM drive devices. If they do not, power off and check the connections of these devices.

Note: When the `BOOT:` prompt appears, do *not* touch the keyboard. Wait for the system to automatically boot in about 60 seconds.

6 Verify the mouse connection. When the “SCO Open Systems Software” screen appears, move the mouse around. The arrow on the screen should also move.

Note: There will be a slight delay before the arrow moves.

7 Verify the date, time and time zone.

a Log in to the AP as `nortel`.

b Click the UNIX window.

c Switch to the root user. Type **`su`** and press <Enter>.

d Enter the root password at the prompt.

e Type **`date`** and press <Enter>.

f Verify that the date, time, and time zone are correct. (If the date is incorrect, see “Changing the system date” on page 2-11; if the time zone is incorrect, see “Changing the system time zone” on page 2-11.)

g Continue with “Verify host connectivity options.”

Verify host connectivity options

1. If the VT100 Host Connectivity option was ordered, verify that the software was loaded, and test the VT-100 board. Refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* for information on VT-100 installation, software, and testing.
2. If the 3270 or 5250 Host Connectivity option was ordered, verify that the software was loaded. Refer to the *Symposium OPEN IVR SNA Host Communication Guide* for information on 3270/5250 software installation, configuration, and testing.

Checking the license file

You may want to check the license file to verify current licensing information. To check the license file on the AP, follow these steps.

1. Log in to the AP as `nortel`.
2. Click the xterm shell window.
3. At the prompt, type **`lmstat -A | more`** and press <Enter>.

   The system displays the license file information.

Final installation steps

1. Verify the modem connection. See “Remote login to the AP, MRS/AP, or MRS using PPP” on page 11-7.
2. If the MRS has been installed, verify the LAN connection. See “Verifying the communication link” on page 23-19 for information on verifying the LAN connection.
3. Shut down the AP. See “Shutting down the AP or MRS/AP” on page 2-7.
4. Proceed to the MRS/Tower or MRS/Rack installation procedures.
5. Keep the Symposium OPEN IVR 4.0 documentation with the IVR system.

Chapter 4: MRS/AP (300tp) installation

Introduction

At the customer site, installation is coordinated with the customer, the distributor responsible for the installation, and any local contractors required for wiring phone lines, power, and data cables to the incoming system.

A summary of the installation process is included in the installation procedures. An experienced IVR installer can use this installation summary and refer to the detail on the following pages when needed.

Steps for physical installation of the system

Installation roadmap

To install the MRS/AP, complete the steps in the following roadmap:

Installation roadmap		
Step	**What to do**	**How to do it**
1	Remove the MRS/AP and peripherals from the packaging.	“Removing components from packaging” on page 4-3.
2	Verify that you have all of the necessary components for the installation.	“Checklist — necessary components for the installation” on page 4-3.
3	Remove the cover from the MRS/AP.	“Removing the chassis cover of the MRS/AP” on page 4-4.
4	Check to make sure that all cards, boards, and cable connectors are seated properly.	“Inspecting the chassis” on page 4-5.

Installation roadmap		
Step	**What to do**	**How to do it**
5	Remove the drive bay shipping bracket on the MRS/AP.	"Removing the drive bay shipping bracket" on page 4-6.
6	Install host connectivity hardware (if it was ordered and received separately).	For the 3270/5250 Token Ring or SDLC board, refer to the *Symposium OPEN IVR SNA Host Communication Guide* (P0881750). For the VT100 board, refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* (P0881286).
7	Replace the MRS/AP cover.	"Replacing the MRS/AP cover" on page 4-9.
8	Connect devices to the backplane: • mouse • keyboard • monitor • License Manager security keylock	"Connecting peripherals" on page 4-9.
9	Add the external modem.	"Adding a modem for Remote Access Service (RAS)" on page 4-11.
10	Connect the MRS/AP to the LAN.	"Connecting to the LAN" on page 4-11.
11	Connect the telephony cables to the MRS/AP.	"Connecting the telephony lines" on page 4-11.
12	Connect the UPS cable to the MRS/AP.	"Connecting the UPS cable" on page 4-12.
13	Power up the system.	"Powering up the system" on page 4-12.
14	Verify, test, and configure host communication options.	"Verify host connectivity options" on page 4-14.
15	Check the license file.	"Checking the license file" on page 4-14
16	Perform final steps.	"Final installation steps" on page 4-15.

Removing components from packaging

When removing the MRS/AP, optional hardware, and peripherals from the shipping cartons, use the checklist below to confirm that you have received everything required to install your system.

Place the monitor and optional UPS in the preplanned location and continue with the steps to install the MRS/AP.

Checklist — necessary components for the installation

Before you begin, make sure that you have all hardware components necessary for installing your MRS/AP. Use the following checklist as a guide.

Component checklist	✔
Base system	
MRS/AP	
MRS/AP power cable	
Monitor	
Monitor power cable and cable to connect monitor to the MRS/AP	
Keyboard and keyboard cable	
Mouse	
License Manager security keylock	
Keys	
U.S. Robotics Sportster 33.6 Kbps external modem (North America and some Caribbean and Latin American countries only)	
Modem cables	
System options	
Uninterruptible Power Source (UPS)	
Cable to connect UPS to the MRS/AP	
Host connectivity cards and cables	

Component checklist	✔
LAN cards and cables	
Software options	
System software on CD-ROM (not required for installation, but store in a safe place)	

Removing the chassis cover of the MRS/AP

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Requirements for removing the MRS/AP chassis cover

Before removing the cover, you need a chassis key.

Removing the chassis cover

To remove the chassis cover, follow these steps.

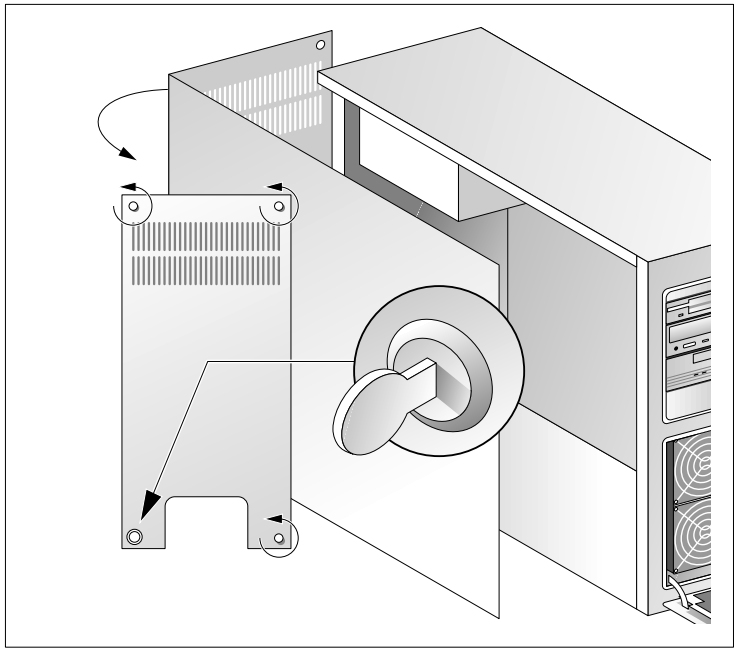
1 If the MRS/AP is powered on, shut the MRS/AP down and then power down the MRS/AP. To shut down the MRS/AP, at the `root` prompt type **`shutdown -y -g0`** and press <Enter>. (For more information on shutting down the MRS/AP, see “Shutting down the AP or MRS/AP” on page 2-7.)

2 Disconnect the power cord from the power outlet.

3 Move the system so that there is a minimum of 4 feet of unencumbered space at the rear of the chassis.

4 Obtain the chassis key from the customer, and unlock the chassis cover.

Figure 4-1: Removing the chassis cover



5 Loosen the three thumbscrews located at the rear of the chassis.

6 Slide the cover toward the rear of the chassis until it is free.

7 Disconnect the power cable from the MRS/AP.

Inspecting the chassis

Introduction

To ensure that the system components are connected properly, you should perform a visual check for loose boards or foreign matter in the chassis. Be sure to inspect the chassis before you continue with the installation.

Inspecting the chassis

Note: Follow these steps to inspect the chassis. If any options were not pre-installed, this would be the appropriate time to install them.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1. Remove the chassis cover as described in this chapter.
2. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
3. Remove the card retaining arm.
4. Carefully check all cards to ensure they are fully seated on the baseboard.
5. Check for any loose wires or foreign objects, such as loose screws, inside the chassis.
6. Check that the SCbus cable is connected to all telco and option cards.
7. Replace the card retaining arm.
8. Before you reinstall the cover, go to the procedure “Removing the drive bay shipping bracket” on page 4-6.

   Note: If you have received host connectivity hardware not installed at the factory, go to “Installing host connectivity options not pre-installed” on page 4-8 before reinstalling and securing the cover.

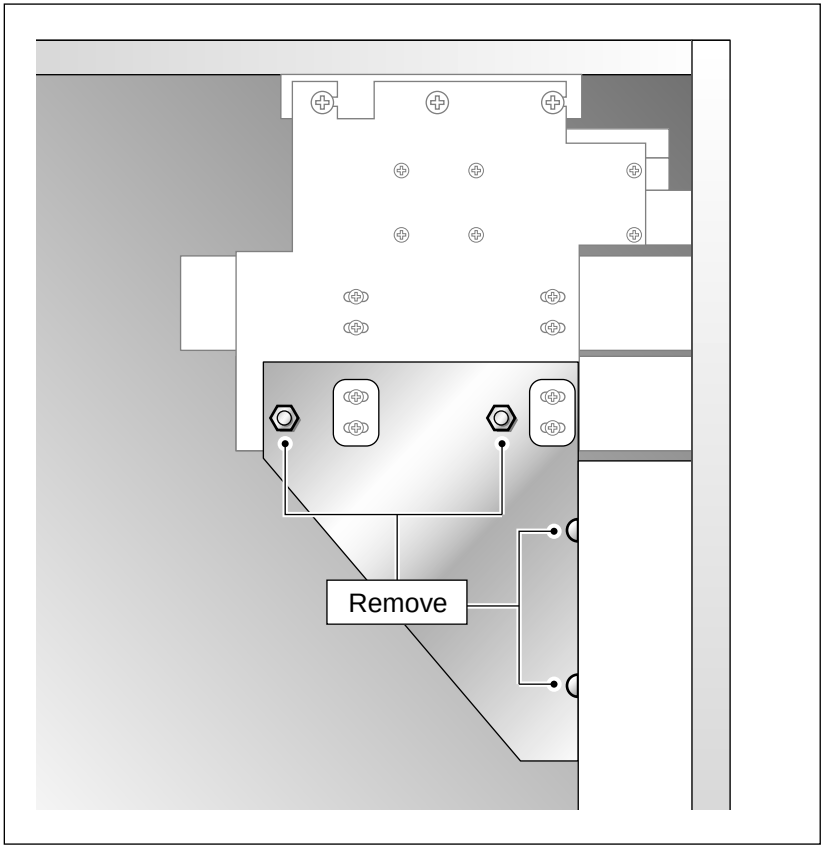
Removing the drive bay shipping bracket

Description

A triangle-shaped bracket is secured to the drive bay and the underframe of the chassis for shipping.

The bracket is used to provide added stability for the drive bay during shipping, and must be removed at the customer site before installing the system.

Figure 4-2: Removing the drive bay shipping bracket



Gathering the tools

Before removing the shipping bracket, gather the following tools:

- one wrench, to remove nuts
- one Phillips-head screwdriver

Removing the drive bay shipping bracket

To remove the shipping bracket, follow these steps.

1 Remove the chassis cover if you have not already done so.

2 Locate the triangular-shaped bracket joined to the drive bay and the underframe of the chassis.

3 Remove the two nuts securing the bracket to the drive bay and the two screws securing the bracket to the chassis.

4 Lift the bracket out of the chassis.

5 Replace the nuts on the drive bay and the screws on the fan housing for safe storage.

6 Replace the chassis cover.

7 Save the bracket in case the system needs to be shipped in the future.

Installing host connectivity options not pre-installed

Refer to the following two guides to install the host connectivity hardware.

To install the	Refer to
3270/5250 Token Ring or SDLC board	*Symposium OPEN IVR SNA Host Communications Guide*
VT100 board	*Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide*

Replacing the MRS/AP cover

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Replacing the MRS/AP chassis cover

To replace the chassis cover, follow these steps.

1. Align the cover with the chassis so that the contoured lip at the top of the cover fits under the chassis, and the curved lip at the bottom of the cover fits over the chassis.
2. Slide the cover toward the front of the chassis until it fits smoothly and securely with the chassis.
3. Lock the cover at the rear of the chassis with the chassis key.

Connecting peripherals

Introduction

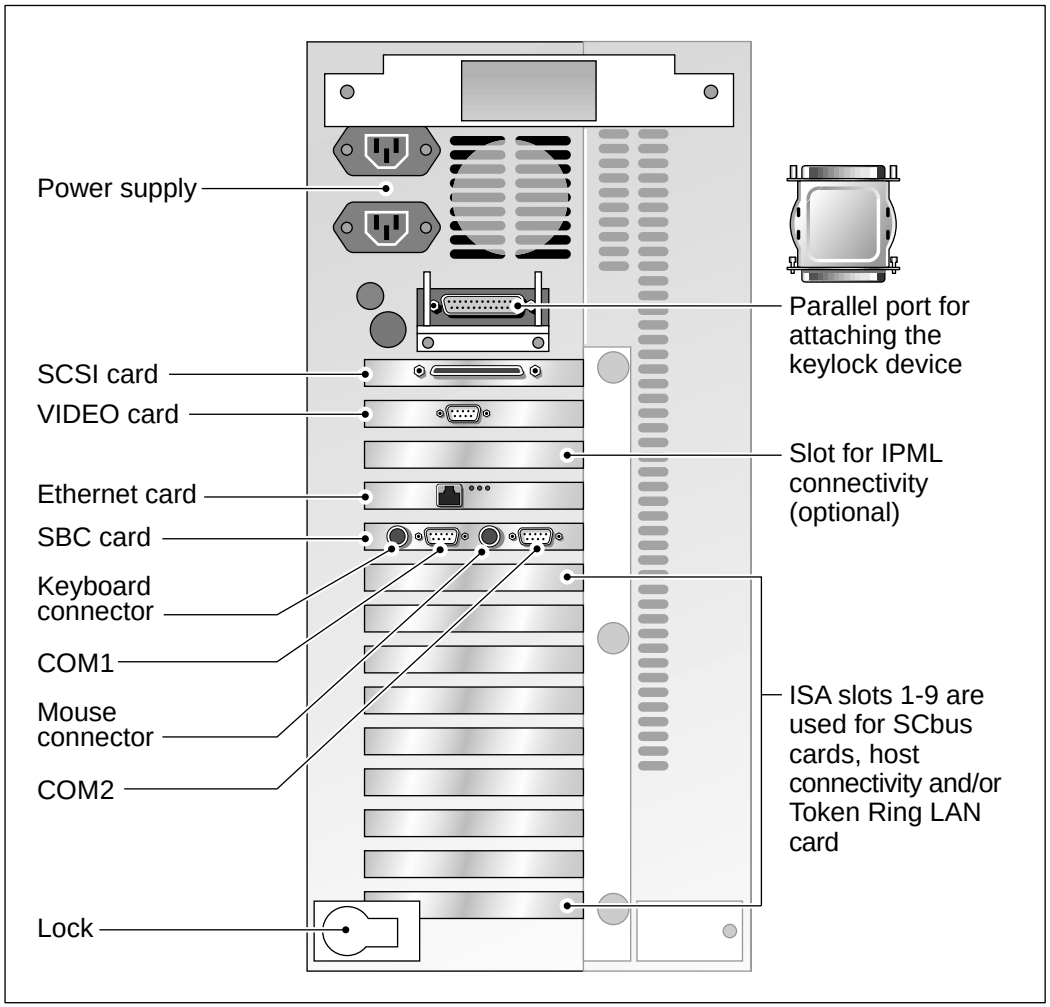
You will need to add peripheral devices to your MRS/AP. This procedure aids in installing the mouse, keyboard, License Manager security keylock, and monitor.

Note: Symposium OPEN IVR 4.0 only supports network printers. Printer configuration is a UNIX procedure and is independent of Symposium OPEN IVR 4.0.

Before you begin

A legend is located adjacent to the peripheral connector panel at the back of the MRS/AP. This legend shows the symbol for each peripheral and which connector to use.

Figure 4-3: Rear panel connections on the MRS/AP



Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then Ethernet cards are optional depending on your system requirements.

Other peripheral devices

You should not add other peripheral devices to your MRS/AP. Other peripherals are not supported by Nortel.

Connecting peripheral devices

To connect peripherals and the power cord to the MRS/AP, follow these steps.

1. Ensure the machine is not plugged into a power source.
2. Plug the keyboard connector into the keyboard DIN connector at the rear of the chassis.
3. Plug the mouse connector into the PS/2 connector. Check the legend for correct connections.
4. Connect the License Manager security keylock. The security keylock is labeled to indicate the corresponding server.
5. Plug in the monitor connector. Tighten the screws on the connector.
6. Plug the monitor power cord into a wall receptacle or power bar. Do not turn on the monitor at this time.

Note: *Do not* turn the MRS/AP on at this time.

Adding a modem for Remote Access Service (RAS)

When you add a modem to your MRS/AP, you can access the MRS/AP by a remote service PC. RAS enables you to perform many activities remotely, including maintenance and diagnostics. RAS is required for Nortel support.

For modem installation instructions, see Chapter 11, "Remote access."

Connecting to the LAN

Connect the LAN cable. For information on connecting the MRS/AP to the LAN, see Chapter 17, "LAN card installation."

For information on connecting host connectivity options hardware to the host, refer to your Symposium OPEN IVR host connectivity documentation.

Connecting the telephony lines

Connect the telephony lines to the MRS/AP. For information on the telephony cards in the MRS/AP, see Chapter 19, "Telco interface card installation."

Connecting the UPS cable

If the UPS was ordered for your system, connect the UPS computer interface cable from the Computer Interface Port (DB9 connector) on the rear panel of the UPS to COM port 2 on the MRS/AP. For more information on the UPS and its installation, refer to Chapter 9, "Uninterruptible Power Source (UPS) option."

Powering up the system

Connecting the MRS/AP to the AC power source

To connect the MRS/AP to the AC power source, follow these steps.

1 Check the AC grounding receptacle power source for the power properties.

- **a** Using a voltmeter, check the voltage from the ground to the primary lead. You should obtain the standard input voltage.
- **b** Using a voltmeter, check the voltage from the ground to the neutral lead. The reading should be .5 volts or less.
- **c** Using an ohmmeter, verify the resistance from the ground to neutral. The reading should be less than .25 ohms.

2 Connect the MRS/AP to an isolated grounding receptacle power source.

- **a** Attach the power cable to the power inlet on the rear of the MRS/AP.
- **b** Plug the other end of the power cable into the wall outlet or the optional UPS.
- **c** If the MRS/AP powers up when it is plugged in, turn the MRS/AP off.
- **d** Use tie-wraps to secure the cables to the MRS/AP chassis, if possible. Doing this helps the MRS/AP cable connections to remain stable if the MRS/AP is moved.

3 If the UPS was ordered, follow these steps.

a Turn on the UPS. Press the On/Test button for one second.

The UPS will beep and then perform a self-test. The UPS simulates a blackout and switches to on-battery operation. This is the SELF TEST feature which ensures that the UPS is working properly and that its battery does not need replacing. This test will last another 8 to 10 seconds and completes when the On Line light stops flashing.

b Check that the Site Wire Fault Indicator on the rear panel of the UPS is *not* lit. If it is lit, notify the site administrator that a qualified electrician needs to check the outlet for incorrect grounding (for example, voltage potential exists between the neutral and the ground wire).

Turning on the MRS/AP

1 If your MRS/AP is connected to an optional UPS, make sure that the UPS power is turned on before you turn on the MRS/AP.

2 Turn on the MRS/AP monitor by pressing the monitor power switch.

3 Turn on the MRS/AP by pressing the MRS/AP power switch.

4 A Keyboard Detected and a Mouse Detected message should appear on the display when the MRS/AP senses these devices. If they do not, power off and check the connections of these devices.

5 A SCSI ID #0 Seagate, a SCSI ID #2 Seagate or Pryhon, and a SCSI ID #5 TEAC message should appear on the display when the MRS/AP senses the hard disk, tape drive, and CD-ROM drive devices. If they do not, power off and check the connections of these devices.

Note: When the `BOOT:` prompt appears, do *not* touch the keyboard. Wait for the system to automatically boot in about 60 seconds.

6 Verify the mouse connection. When the “SCO Open Systems Software” screen appears, move the mouse around. The arrow on the screen should also move.

Note: There will be a slight delay before the arrow moves.

7 Verify the date, time and time zone.

a Log in to the MRS/AP as `nortel`.

b Click the UNIX window.

c Switch to the root user. Type **su** and press <Enter>.

d Enter the root password at the prompt.

e Type **`date`** and press <Enter>.

f Verify that the date, time, and time zone are correct. (If the date is incorrect, see “Changing the system date” on page 2-11; if the time zone is incorrect, see “Changing the system time zone” on page 2-11.)

g Continue with “Verify host connectivity options.”

Verify host connectivity options

1 If the VT100 Host Connectivity option was ordered, verify that the software was loaded, and test the VT-100 board. Refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* for information on VT-100 installation, software, and testing.

2 If the 3270 or 5250 Host Connectivity option was ordered, verify that the software was loaded. Refer to the *Symposium OPEN IVR SNA Host Communication Guide* for information on 3270/5250 software installation, configuration, and testing.

Checking the license file

You may want to check the license file to verify current licensing information. To check the license file on the MRS/AP, follow these steps.

1 Log in to the MRS/AP as `nortel`.

2 Click the xterm shell window.

3 At the prompt, type **`lmstat -A | more`** and press <Enter>.

The system displays the license file information.

Final installation steps

1. Verify the modem connection. See “Remote login to the AP, MRS/AP, or MRS using PPP” on page 11-7.
2. Verify the LAN connection. See “Verifying the communication link” on page 23-19 for information on verifying the LAN connection.
3. Verify the telephony connections.
4. Perform a full system image backup to be stored by the distributor. See “Creating a system image backup” on page 15-4. The original system image backup tape that is shipped with the system should be stored on site in a safe place.
5. Keep the Symposium OPEN IVR 4.0 documentation with the IVR system.

Chapter 5: Tower AP (700tp) and Rack AP installation

Overview

At the customer site, installation is coordinated with the customer, the distributor responsible for the installation, and any local contractors required for wiring phone lines, power, and data cables to the incoming system.

A summary of the installation process is included in the installation procedures. An experienced IVR installer can use this installation summary and refer to the detail on the following pages when needed.

> ***Note:*** If you are installing an MRS/AP (700tp), proceed to Chapter 6, "MRS/AP (700tp) installation."

Steps for physical installation of the system

Installation roadmap

To install the AP, complete the steps in the following roadmap:

Installation roadmap		
Step	**What to do**	**How to do it**
1	Remove the AP and peripherals from the packaging.	"Removing components from packaging" on page 5-3.
2	Verify that you have all of the necessary components for the installation.	"Checklist — necessary components for the installation" on page 5-3.
3	Install the cabinet (optional — for Rack AP only)	Appendix C, "Installing the cabinet and rack-mountable components."

Installation roadmap		
Step	**What to do**	**How to do it**
4	Remove the cover from the AP.	“Removing the AP chassis cover” on page 5-5.
5	Check to make sure that all cards, boards, and cable connectors are seated properly.	“Inspecting the chassis” on page 5-8.
6	Install host connectivity hardware (if it was ordered and received separately).	For the 3270/5250 Token Ring or SDLC board, refer to the *Symposium OPEN IVR SNA Host Communication Guide* (P0881750). For the VT100 board, refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* (P0881286).
7	Replace the AP cover.	“Replacing the AP covers” on page 5-9.
8	Install the power supply module(s) into the Rack AP if they were shipped uninstalled	“Replacing the power supply” on page 21-36
9	Install the Rack AP into the cabinet	Appendix C, “Installing the cabinet and rack-mountable components.”
10	Connect devices to the backplane: • mouse • keyboard • monitor • License Manager security keylock	“Connecting peripherals” on page 5-10.
11	Add the external modem.	“Adding a modem for remote access” on page 5-14.
12	Connect the AP to the LAN.	“Connecting the cables to the LAN” on page 5-14.”
13	Connect the UPS cable to the AP.	Chapter 9, “Uninterruptible Power Source (UPS) option.”
14	Power up the system.	“Powering up the system” on page 5-15.

Installation roadmap		
Step	**What to do**	**How to do it**
15	Verify, test, and configure host communication options.	“Verify host connectivity options” on page 5-17.
16	Check the license file.	“Checking the license file” on page 5-17
17	Perform final steps.	“Final installation steps” on page 5-18.

Removing components from packaging

When removing the AP, optional hardware, and peripherals from the shipping cartons, use the checklist below to confirm that you have received everything required to install your system.

Place the monitor and optional UPS in the preplanned location and continue with the steps to install the AP.

Checklist — necessary components for the installation

Before you begin, make sure that you have all hardware components necessary for installing your AP. Use the following checklist as a guide.

Component checklist	✔
Base system	
Application Processor (AP)	
AP power cable	
Power supply module(s), which may be shipped uninstalled for the Rack AP	
Monitor	
Monitor power cable and cable to connect monitor to the AP	
Keyboard and keyboard cable	
Mouse	
License Manager security keylock	

Component checklist	✔
U.S. Robotics Sportster 33.6 Kbps external modem (North America and some Caribbean and Latin American countries only)	
Modem cables	
System options	
Cabinet (Rack AP only)	
Uninterruptible Power Source (UPS)	
Cable to connect UPS to the AP	
Host connectivity cards and cables	
LAN cards and cables	
Software options	
System software on CD-ROM (not required for installation, but store in a safe place)	

Installing the cabinet for the Rack AP (optional)

If the optional cabinet was ordered for your installation, install it in the preplanned location before you begin the other steps. See Appendix C, “Installing the cabinet and rack-mountable components.”

Removing the AP chassis cover

The cover removal depends on the AP model you have. The procedure for the Tower AP begins below. For the Rack AP, see “Requirements for removing the Rack AP top cover” on page 5-7.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

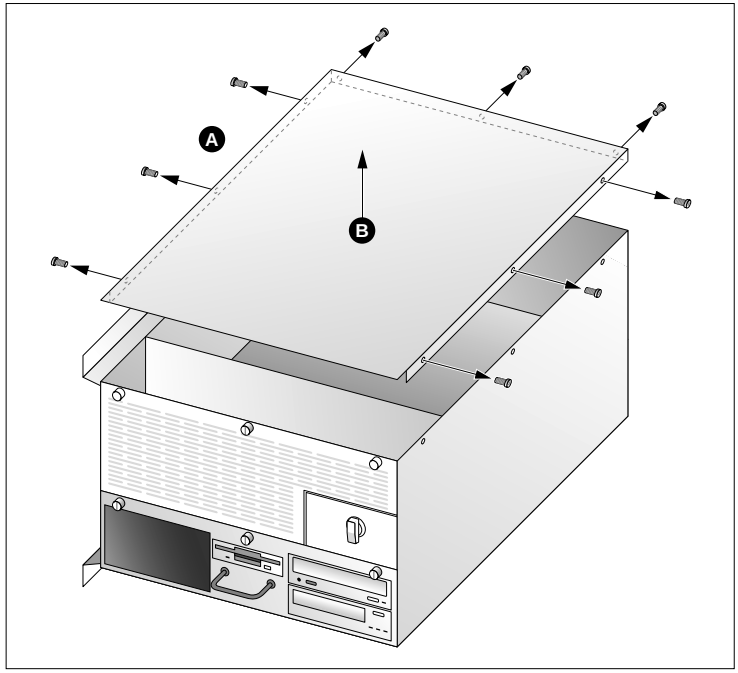
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Requirements for removing the Tower AP chassis cover

Before removing the cover, gather the following tools.

- Phillips-head screwdriver
- ESD wrist strap

Figure 5-1: Removing the chassis cover



Removing the Tower AP chassis cover

To remove the chassis cover, follow these steps.

1 If the Tower AP is powered on, shut it down and then power down the Tower AP. For more information on shutting down the Tower AP, see “Shutting down the AP or MRS/AP” on page 2-7.)

2 Ensure the AC power cord is unplugged from the chassis and the AC outlet.

3 Turn the Tower AP on its side so that the media tray is at the bottom and the cover is on top.

4 Remove the nine Phillips-head screws that secure the cover. When the Tower AP is on its side, three screws are on the left and right sides and three are at the rear of the chassis.

5 Remove the chassis cover by pulling the cover toward the rear of the chassis, then lifting it up and off.

6 Remove the two Phillips-head screws that hold the card retaining arm.

7 Remove the card retaining arm.

Requirements for removing the Rack AP top cover

Before removing the cover, gather the following tools:

- Phillips-head screw driver
- electrostatic discharge (ESD) wrist strap.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Removing the Rack AP top cover

To remove the Rack AP top cover, follow these steps.

1 If the AP is powered on, shut the AP down and then power down the AP. To shut down the AP, at the `root` prompt type **`shutdown -y -g0`** and press <Enter>. (For more information on shutting down the AP, see “Shutting down the AP or MRS/AP” on page 2-7.)

2 Ensure the AC power cord is unplugged from the chassis and the AC outlet.

3 Loosen the three thumbscrews at the rear of the top cover.

4 Remove the top cover by pulling it toward the rear of the chassis, then lifting it up and off.

Inspecting the chassis

To ensure that the system components are connected properly, you should perform a visual check for loose boards or foreign matter in the chassis. Be sure to inspect the chassis before you continue with the installation.

To inspect the chassis, follow these steps.

1. Remove the chassis cover as described in “Removing the AP chassis cover” on page 5-5.
2. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
3. Carefully check all cards to ensure they are fully seated on the baseboard.
4. Check for any loose wires or foreign objects, such as loose screws, inside the chassis.
5. When you finish your inspection, reinstall the cover.

Installing host connectivity options not pre-installed

Refer to the following two guides to install the host connectivity hardware.

To install the	Refer to
3270/5250 Token Ring or SDLC board	*Symposium OPEN IVR SNA Host Communications Guide*
VT100 board	*Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide*

Replacing the AP covers

The cover replacement depends on the AP model you have. The procedure for the Tower AP begins below. For the Rack AP, see “Replacing the Rack AP chassis cover” on page 5-9.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

Replacing the Tower AP chassis cover

1. Replace the card retaining arm, and screw it into place.
2. Replace the chassis cover by placing it on the machine and sliding it toward the front of the machine
3. Replace the nine Phillips-head screws. When the Tower AP is viewed on its side, three are on the rear and three are on each side.
4. Turn the Tower AP upright.

Replacing the Rack AP chassis cover

To replace the chassis cover, follow these steps.

1. Place the top cover at the rear of the chassis, and slide the cover down and over the chassis toward the front of the AP.
2. Once the cover is in place, tighten the three thumbscrews at the rear of the top cover.

Installing the power supply module(s) in the Rack AP

If the power supply module(s) were shipped uninstalled, install them now. For instructions, see “Replacing the power supply” on page 21-36.

Installing the Rack AP in the cabinet

If a cabinet was purchased for the Rack AP, then refer toAppendix C, “Installing the cabinet and rack-mountable components.”

Connecting peripherals

Note: For a Rack AP that has been installed in a cabinet, leave enough slack on the cables so that the server or a peripheral can be pulled away from the cabinet if necessary for servicing without disconnecting any cables.

Introduction

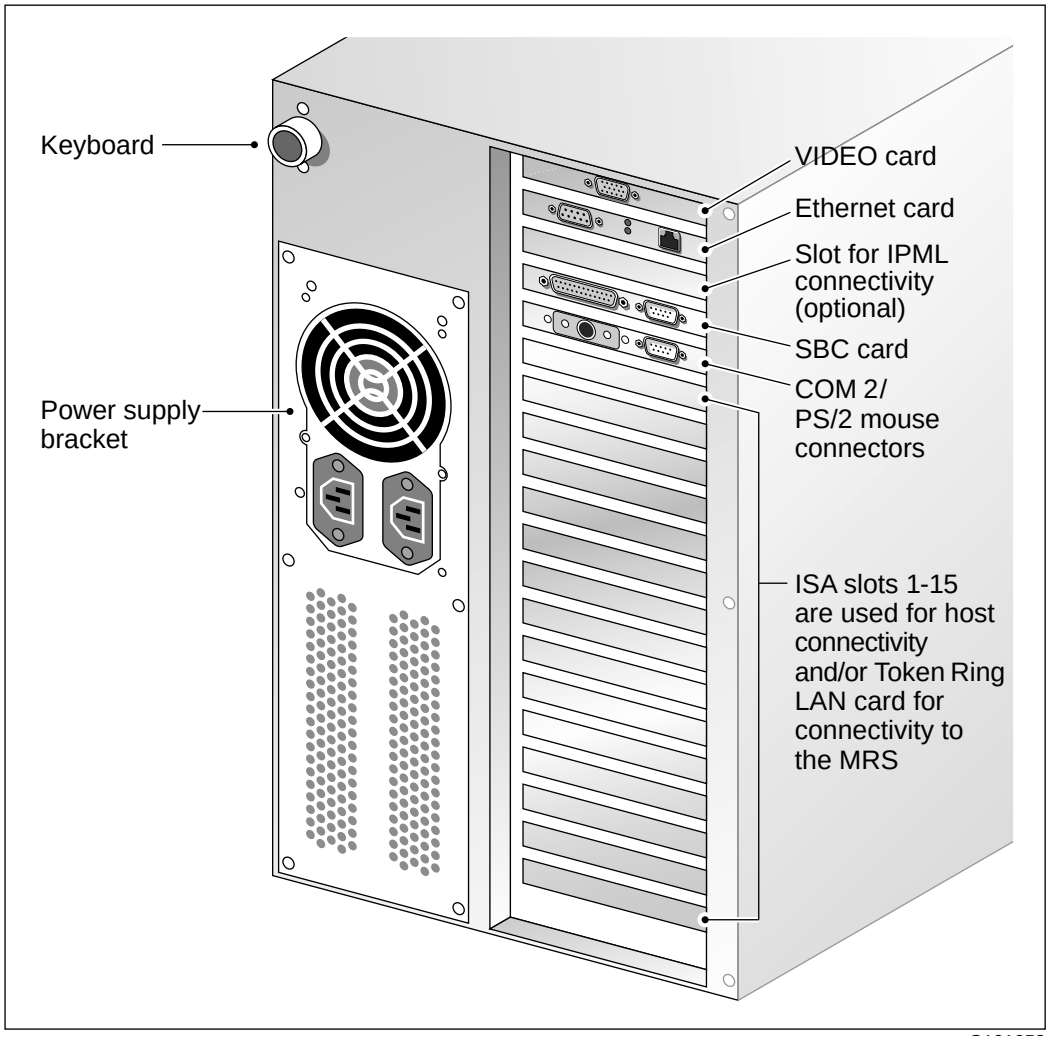
You will need to add peripheral devices to your AP. This procedure aids in installing the mouse, keyboard, License Manager security keylock, and monitor.

Note: Symposium OPEN IVR 4.0 only supports network printers. Printer configuration is a UNIX procedure and is independent of Symposium OPEN IVR 4.0.

Before you begin

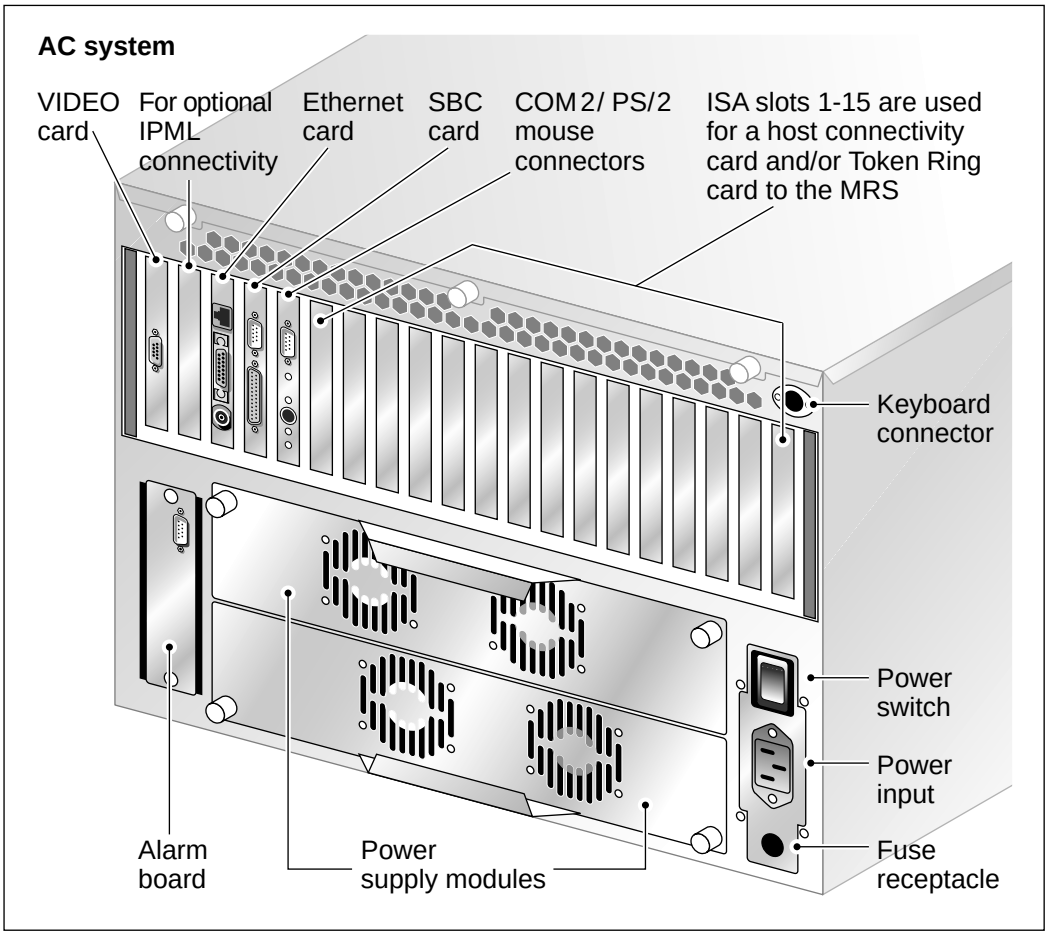
A legend is located adjacent to the peripheral connector panel at the back of the AP. This legend shows the symbol for each peripheral and which connector to use.

Figure 5-2: Rear panel connections


Keyboard
Power supply bracket
VIDEO card
Ethernet card
Slot for IPML connectivity (optional)
SBC card
COM 2/ PS/2 mouse connectors
ISA slots 1-15 are used for host connectivity and/or Token Ring LAN card for connectivity to the MRS

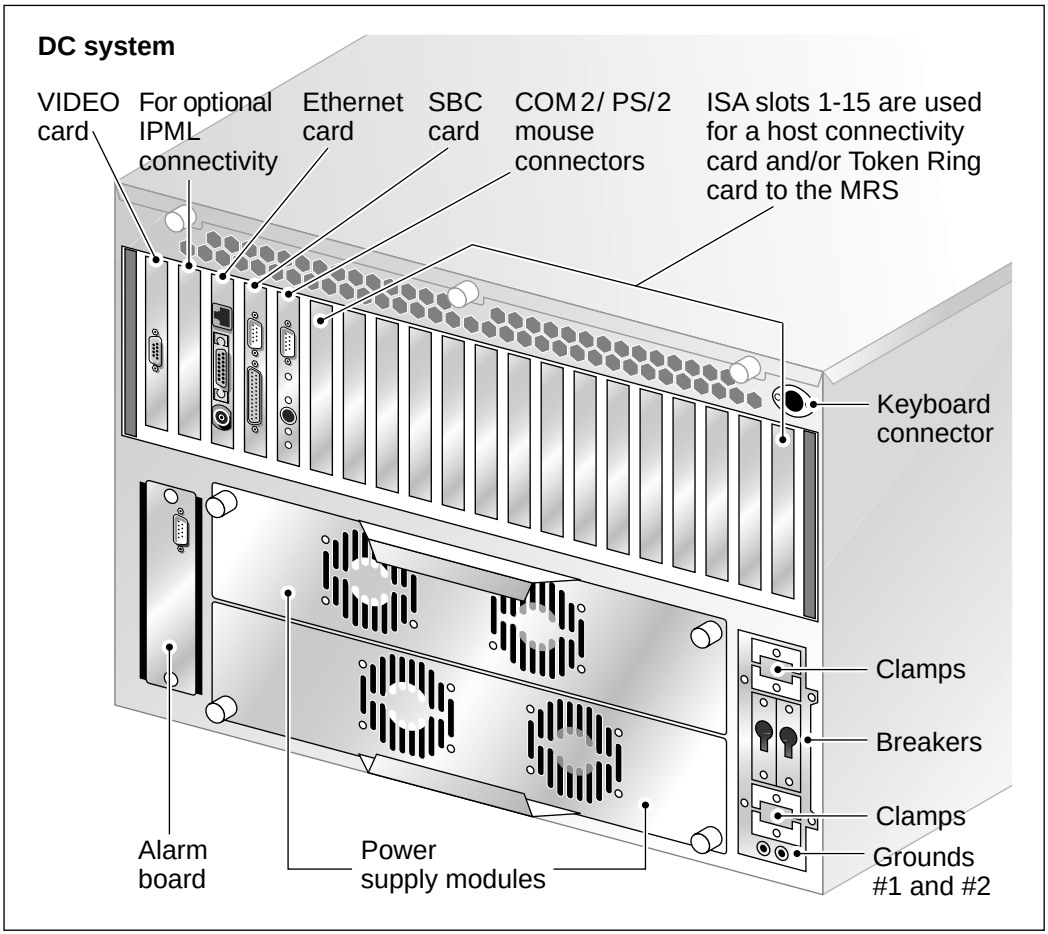
Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then Ethernet cards are optional depending on your system requirements.

Figure 5-3: Rear panel connections for Rack AP (AC power)



Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then Ethernet cards are optional depending on your system requirements.

Figure 5-4: Rear panel connections for Rack AP (DC power)



Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then Ethernet cards are optional depending on your system requirements.

Other peripheral devices

You should not add other peripheral devices to your AP. Other peripherals are not supported by Nortel.

Connecting peripheral devices

To connect peripherals and the power cord to the AP, follow these steps.

1. Ensure the machine is not plugged into a power source.
2. Plug the keyboard connector into the keyboard DIN connector at the rear of the chassis.
3. Plug the mouse connector into the PS/2 connector. Check the legend for correct connections.
4. Connect the License Manager security keylock to the parallel port on the SBC card. The security keylock is labeled to indicate the corresponding server.
5. Plug in the monitor connector. Tighten the screws on the connector.
6. Plug the monitor power cord into a wall receptacle or power bar. Do not turn on the monitor at this time.

   Note: *Do not* turn the AP on at this time.

Adding a modem for remote access

When you add a modem to your AP, you can access the AP from a remote service PC. Remote access enables you to perform many activities remotely, including maintenance and diagnostics.

For modem installation instructions, see Chapter 11, "Remote access."

Connecting the cables to the LAN

Connect the LAN cables. For information on connecting the AP to the LAN, see Chapter 17, "LAN card installation."

For information on connecting host connectivity options hardware to the host, refer to your Symposium OPEN IVR host connectivity documentation.

Connecting the UPS cable

If the UPS was ordered for your system, connect the UPS computer interface cable from the Computer Interface Port (DB9 connector) on the rear panel of the UPS to COM port 2 on the rear panel of the AP. For more information on the UPS and its installation, refer to Chapter 9, "Uninterruptible Power Source (UPS) option."

Powering up the system

Connecting the Tower AP or Rack AP to the AC power source

To connect the AP to the AC power source, follow these steps.

1 Check the AC grounding receptacle power source for the power properties.

- **a** Using a voltmeter, check the voltage from the ground to the primary lead. You should obtain the standard input voltage.
- **b** Using a voltmeter, check the voltage from the ground to the neutral lead. The reading should be .5 volts or less.
- **c** Using an ohmmeter, verify the resistance from the ground to neutral. The reading should be less than .25 ohms.

2 Connect the AP to an isolated grounding receptacle power source.

- **a** Attach the power cable to the power inlet on the rear of the AP.
- **b** Plug the other end of the power cable into the wall outlet or the optional UPS.
- **c** If the AP powers up when it is plugged in, turn the AP off.
- **d** Use tie-wraps to secure the cables to the AP chassis, if possible. Doing this helps the AP cable connections to remain stable if the AP is moved.

3 If the UPS was ordered, follow these steps.

- **a** Turn on the UPS. Press the On/Test button for one second.

  The UPS will beep and then perform a self-test. The UPS simulates a blackout and switches to on-battery operation. This is the SELF TEST feature which ensures that the UPS is working properly and that its battery does not need replacing. This test will last another 8 to 10 seconds and completes when the On Line light stops flashing.
- **b** Check that the Site Wire Fault Indicator on the rear panel of the UPS is *not* lit. If it is lit, notify the site administrator that a qualified electrician needs to check the outlet for incorrect grounding (for example, voltage potential exists between the neutral and the ground wire).

Connecting the Rack AP to the optional DC power source

To connect the Rack AP to the DC power source, follow these steps.

1 Using a Phillips screwdriver, loosen the cable lock screws on the rear panel. (If the redundant DC power option is installed, there will be two power inputs.)

2 Connect the –48 volt DC power source. (If the DC power redundancy option is installed, you must connect both sources.)

3 Tighten the cable lock screws to secure the connectors.

4 Connect the ground wires to the ground terminals at the bottom of the panel, with the primary source grounded on the left terminal, and the secondary source grounded on the right terminal.

Turning on the AP

1 If your AP is connected to an optional UPS, make sure that the UPS power is turned on before you turn on the AP.

2 Turn on the AP monitor by pressing the monitor power switch.

Note: To access the controls of a monitor that is installed in a cabinet (for the Rack AP), you may need to remove the front panel of the monitor enclosure. See “Monitor enclosure” on page C-6.

3 Turn on the AP by pressing the AP power switch.

4 A Keyboard Detected and a Mouse Detected message should appear on the display when the AP senses these devices. If they do not, power off and check the connections of these devices.

5 A SCSI ID #0 Seagate, a SCSI ID #2 Seagate or Pryhon, and a SCSI ID #5 TEAC message should appear on the display when the AP senses the hard disk, tape drive, and CD-ROM drive devices. If they do not, power off and check the connections of these devices.

Note: When the `BOOT:` prompt appears, do *not* touch the keyboard. Wait for the system to automatically boot in about 60 seconds.

6 Verify the mouse connection. When the “SCO Open Systems Software” screen appears, move the mouse around. The arrow on the screen should also move.

Note: There will be a slight delay before the arrow moves.

7 Verify the date, time and time zone.

a Log in to the AP as `nortel`.

b Click the UNIX window.

c Switch to the root user. Type **`su`** and press <Enter>.

d Enter the root password at the prompt.

e Type **`date`** and press <Enter>.

f Verify that the date, time, and time zone are correct. (If the date is incorrect, see “Changing the system date” on page 2-11; if the time zone is incorrect, see “Changing the system time zone” on page 2-11.)

g Continue with “Verify host connectivity options”.”

Verify host connectivity options

1 If the VT100 Host Connectivity option was ordered, verify that the software was loaded, and test the VT-100 board. Refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* for information on VT-100 installation, software, and testing.

2 If the 3270 or 5250 Host Connectivity option was ordered, verify that the software was loaded. Refer to the *Symposium OPEN IVR SNA Host Communication Guide* for information on 3270/5250 software installation, configuration, and testing.

Checking the license file

You may want to check the license file to verify current licensing information. To check the license file on the AP, follow these steps.

1 Log in to the AP as `nortel`.

2 Click the xterm shell window.

3 At the prompt, type **`lmstat -A | more`** and press <Enter>.

The system displays the license file information.

Final installation steps

1. Verify the modem connection. See “Remote login to the AP, MRS/AP, or MRS using PPP” on page 11-7.
2. If the MRS has been installed, verify the LAN connection. See “Verifying the communication link” on page 23-19 for information on verifying the LAN connection.
3. Shut down the AP. See “Shutting down the AP or MRS/AP” on page 2-7.
4. Proceed to the MRS/Tower or MRS/Rack installation procedures.
5. Keep the Symposium OPEN IVR 4.0 documentation with the IVR system.

Chapter 6: MRS/AP (700tp) installation

Overview

At the customer site, installation is coordinated with the customer, the distributor responsible for the installation, and any local contractors required for wiring phone lines, power, and data cables to the incoming system.

A summary of the installation process is included in the installation procedures. An experienced IVR installer can use this installation summary and refer to the detail on the following pages when needed.

Steps for physical installation of the system

Installation roadmap

To install the MRS/AP, complete the steps in the following roadmap:

Installation roadmap		
Step	**What to do**	**How to do it**
1	Remove the MRS/AP and peripherals from the packaging.	"Removing components from packaging" on page 6-3.
2	Verify that you have all of the necessary components for the installation.	"Checklist — necessary components for the installation" on page 6-3.
3	Remove the cover from the MRS/AP.	"Removing the chassis cover of the MRS/AP" on page 6-4.
4	Check to make sure that all cards, boards, and cable connectors are seated properly.	"Inspecting the chassis" on page 6-6.

Installation roadmap		
Step	**What to do**	**How to do it**
5	Install host connectivity hardware (if it was ordered and received separately).	For the 3270/5250 Token Ring or SDLC board, refer to the *Symposium OPEN IVR SNA Host Communication Guide* (P0881750). For the VT100 board, refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* (P0881286).
6	Replace the MRS/AP cover.	"Replacing the MRS/AP covers" on page 6-7.
7	Connect devices to the backplane: • mouse • keyboard • monitor • License Manager security keylock	"Connecting peripherals" on page 6-7.
8	Add the external modem.	"Adding a modem for remote access" on page 6-9.
9	Connect the MRS/AP to the LAN.	"Connecting the cables to the LAN" on page 6-9."
10	Connect the telephony cables to the MRS/AP.	"Connecting the telephony lines" on page 6-9
11	Connect the UPS cable to the MRS/AP.	Chapter 9, "Uninterruptible Power Source (UPS) option."
12	Power up the system.	"Powering up the system" on page 6-10.
13	Verify, test, and configure host communication options.	"Verify host connectivity options" on page 6-12.
14	Check the license file.	"Checking the license file" on page 6-12
15	Perform final steps.	"Final installation steps" on page 6-13.

Removing components from packaging

When removing the MRS/AP, optional hardware, and peripherals from the shipping cartons, use the checklist below to confirm that you have received everything required to install your system.

Place the monitor and optional UPS in the preplanned location and continue with the steps to install the MRS/AP.

Checklist — necessary components for the installation

Before you begin, make sure that you have all hardware components necessary for installing your MRS/AP. Use the following checklist as a guide.

Component checklist	✔
Base system	
MRS/AP	
MRS/AP power cable	
Monitor	
Monitor power cable and cable to connect monitor to the MRS/AP	
Keyboard and keyboard cable	
Mouse	
License Manager security keylock	
U.S. Robotics Sportster 33.6 Kbps external modem (North America and some Caribbean and Latin American countries only)	
Modem cables	
System options	
Uninterruptible Power Source (UPS)	
Cable to connect UPS to the MRS/AP	
Host connectivity cards and cables	
LAN cards and cables	

Component checklist	✔
Software options	
System software on CD-ROM (not required for installation, but store in a safe place)	

Removing the chassis cover of the MRS/AP

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

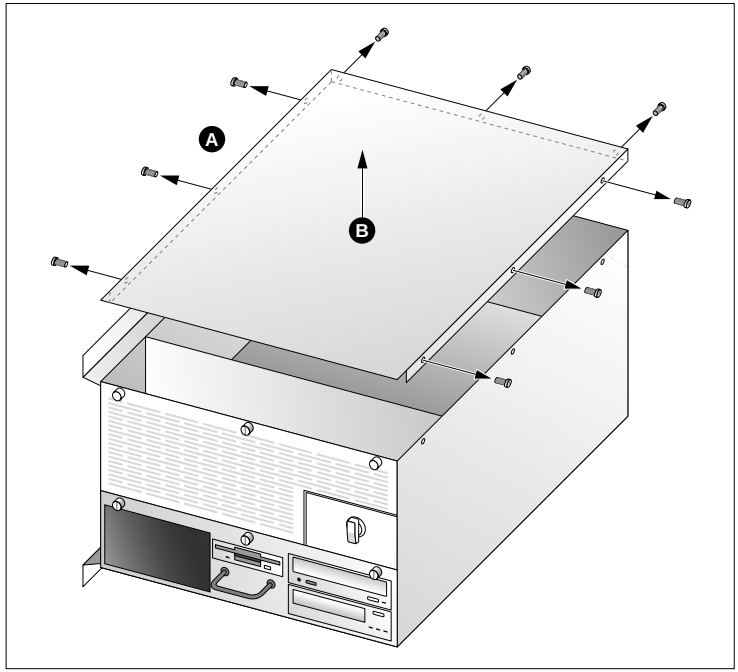
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Requirements for removing the MRS/AP chassis cover

Before removing the cover, gather the following tools.

- Phillips-head screwdriver
- ESD wrist strap

Figure 6-1: Removing the chassis cover



To remove the chassis cover, follow these steps.

1 If the MRS/AP is powered on, shut it down and then power down the MRS/AP. For more information on shutting down the MRS/AP, see “Shutting down the AP or MRS/AP” on page 2-7.)

2 Ensure the AC power cord is unplugged from the chassis and the AC outlet.

3 Turn the MRS/AP on its side so that the media tray is at the bottom and the cover is on top.

4 Remove the nine Phillips-head screws that secure the cover. When the MRS/AP is on its side, three screws are on the left and right sides and three are at the rear of the chassis.

5 Remove the chassis cover by pulling the cover toward the rear of the chassis, then lifting it up and off.

6 Remove the two Phillips-head screws that hold the card retaining arm.

7 Remove the card retaining arm.

Inspecting the chassis

To ensure that the system components are connected properly, you should perform a visual check for loose boards or foreign matter in the chassis. Be sure to inspect the chassis before you continue with the installation.

To inspect the chassis, follow these steps.

1. Remove the chassis cover as described in “Removing the chassis cover of the MRS/AP” on page 6-4.
2. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
3. Carefully check all cards to ensure they are fully seated on the baseboard.
4. Check that the SCbus cable is connected to all telco and option cards.
5. Check for any loose wires or foreign objects, such as loose screws, inside the chassis.
6. When you finish your inspection, reinstall the cover.

Installing host connectivity options not pre-installed

Refer to the following two guides to install the host connectivity hardware.

To install the	Refer to
3270/5250 Token Ring or SDLC board	*Symposium OPEN IVR SNA Host Communications Guide*
VT100 board	*Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide*

Replacing the MRS/AP covers

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

1 Replace the card retaining arm, and screw it into place.

2 Replace the chassis cover by placing it on the machine and sliding it toward the front of the machine

3 Replace the nine Phillips-head screws. When the MRS/AP is viewed on its side, three are on the rear and three are on each side.

4 Turn the MRS/AP upright.

Connecting peripherals

Introduction

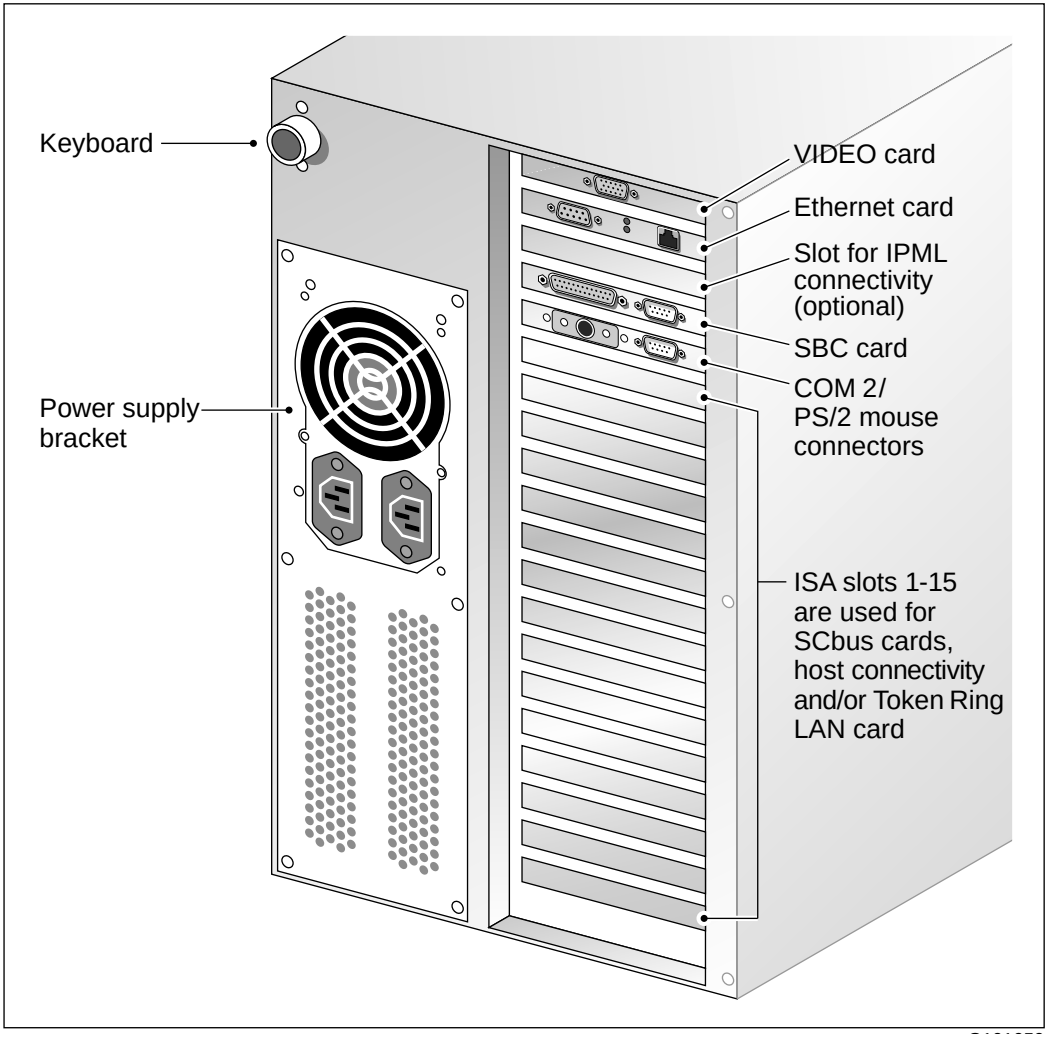
You will need to add peripheral devices to your MRS/AP. This procedure aids in installing the mouse, keyboard, License Manager security keylock, and monitor.

Note: Symposium OPEN IVR 4.0 only supports network printers. Printer configuration is a UNIX procedure and is independent of Symposium OPEN IVR 4.0.

Before you begin

A legend is located adjacent to the peripheral connector panel at the back of the MRS/AP. This legend shows the symbol for each peripheral and which connector to use.

Figure 6-2: Rear panel connections


Keyboard
Power supply bracket
VIDEO card
Ethernet card
Slot for IPML connectivity (optional)
SBC card
COM 2/ PS/2 mouse connectors
ISA slots 1-15 are used for SCbus cards, host connectivity and/or Token Ring LAN card

Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then Ethernet cards are optional depending on your system requirements.

Other peripheral devices

You should not add other peripheral devices to your MRS/AP. Other peripherals are not supported by Nortel.

Connecting peripheral devices

To connect peripherals and the power cord to the MRS/AP, follow these steps.

1. Ensure the machine is not plugged into a power source.
2. Plug the keyboard connector into the keyboard DIN connector at the rear of the chassis.
3. Plug the mouse connector into the PS/2 connector. Check the legend for correct connections.
4. Connect the License Manager security keylock to the parallel port on the SBC card. The security keylock is labeled to indicate the corresponding server.
5. Plug in the monitor connector. Tighten the screws on the connector.
6. Plug the monitor power cord into a wall receptacle or power bar. Do not turn on the monitor at this time.

Note: *Do not* turn the MRS/AP on at this time.

Adding a modem for remote access

When you add a modem to your MRS/AP, you can access the MRS/AP from a remote service PC. Remote access enables you to perform many activities remotely, including maintenance and diagnostics.

For modem installation instructions, see Chapter 11, "Remote access."

Connecting the cables to the LAN

Connect the LAN cables. For information on connecting the MRS/AP to the LAN, see Chapter 17, "LAN card installation."

For information on connecting host connectivity options hardware to the host, refer to your Symposium OPEN IVR host connectivity documentation.

Connecting the telephony lines

Connect the telephony lines to the MRS/AP. For information on the telephony cards in the MRS/AP, see "Telco interface card installation" on page 19-1.

Connecting the UPS cable

If the UPS was ordered for your system, connect the UPS computer interface cable from the Computer Interface Port (DB9 connector) on the rear panel of the UPS to COM port 2 on the rear panel of the MRS/AP. For more information on the UPS and its installation, refer to Chapter 9, "Uninterruptible Power Source (UPS) option."

Powering up the system

Connecting the MRS/AP to the AC power source

To connect the MRS/AP to the AC power source, follow these steps.

1 Check the AC grounding receptacle power source for the power properties.

- **a** Using a voltmeter, check the voltage from the ground to the primary lead. You should obtain the standard input voltage.
- **b** Using a voltmeter, check the voltage from the ground to the neutral lead. The reading should be .5 volts or less.
- **c** Using an ohmmeter, verify the resistance from the ground to neutral. The reading should be less than .25 ohms.

2 Connect the MRS/AP to an isolated grounding receptacle power source.

- **a** Attach the power cable to the power inlet on the rear of the MRS/AP.
- **b** Plug the other end of the power cable into the wall outlet or the optional UPS.
- **c** If the MRS/AP powers up when it is plugged in, turn the MRS/AP off.
- **d** Use tie-wraps to secure the cables to the MRS/AP chassis, if possible. Doing this helps the MRS/AP cable connections to remain stable if the MRS/AP is moved.

3 If the UPS was ordered, follow these steps.

a Turn on the UPS. Press the On/Test button for one second.

The UPS will beep and then perform a self-test. The UPS simulates a blackout and switches to on-battery operation. This is the SELF TEST feature which ensures that the UPS is working properly and that its battery does not need replacing. This test will last another 8 to 10 seconds and completes when the On Line light stops flashing.

b Check that the Site Wire Fault Indicator on the rear panel of the UPS is *not* lit. If it is lit, notify the site administrator that a qualified electrician needs to check the outlet for incorrect grounding (for example, voltage potential exists between the neutral and the ground wire).

Turning on the MRS/AP

1 If your MRS/AP is connected to an optional UPS, make sure that the UPS power is turned on before you turn on the MRS/AP.

2 Turn on the MRS/AP monitor by pressing the monitor power switch.

3 Turn on the MRS/AP by pressing the MRS/AP power switch.

4 A Keyboard Detected and a Mouse Detected message should appear on the display when the MRS/AP senses these devices. If they do not, power off and check the connections of these devices.

5 A SCSI ID #0 Seagate, a SCSI ID #2 Seagate or Pryhon, and a SCSI ID #5 TEAC message should appear on the display when the MRS/AP senses the hard disk, tape drive, and CD-ROM drive devices. If they do not, power off and check the connections of these devices.

Note: When the `BOOT:` prompt appears, do *not* touch the keyboard. Wait for the system to automatically boot in about 60 seconds.

6 Verify the mouse connection. When the “SCO Open Systems Software” screen appears, move the mouse around. The arrow on the screen should also move.

Note: There will be a slight delay before the arrow moves.

7 Verify the date, time and time zone.

a Log in to the MRS/AP as `nortel`.

b Click the UNIX window.

c Switch to the root user. Type **su** and press <Enter>.

d Enter the root password at the prompt.

e Type **`date`** and press <Enter>.

f Verify that the date, time, and time zone are correct. (If the date is incorrect, see “Changing the system date” on page 2-11; if the time zone is incorrect, see “Changing the system time zone” on page 2-11.)

g Continue with “Verify host connectivity options”.”

Verify host connectivity options

1 If the VT100 Host Connectivity option was ordered, verify that the software was loaded, and test the VT-100 board. Refer to the *Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide* for information on VT-100 installation, software, and testing.

2 If the 3270 or 5250 Host Connectivity option was ordered, verify that the software was loaded. Refer to the *Symposium OPEN IVR SNA Host Communication Guide* for information on 3270/5250 software installation, configuration, and testing.

Checking the license file

You may want to check the license file to verify current licensing information. To check the license file on the MRS/AP, follow these steps.

1 Log in to the MRS/AP as `nortel`.

2 Click the xterm shell window.

3 At the prompt, type **`lmstat -A | more`** and press <Enter>.

The system displays the license file information.

Final installation steps

1. Verify the modem connection. See “Remote login to the AP, MRS/AP, or MRS using PPP” on page 11-7.
2. Verify the LAN connection. See “Verifying the communication link” on page 23-19 for information on verifying the LAN connection.
3. Verify the telephony connections.
4. Perform a full system image backup to be stored by the distributor. See “Creating a system image backup” on page 15-4. The original system image backup tape that is shipped with the system should be stored on site in a safe place.
5. Keep the Symposium OPEN IVR 4.0 documentation with the IVR system.

Chapter 7: MRS/Tower installation

Overview

When the MRS/Tower is installed, it is positioned between the AP and the public switch telephone network (PSTN). The MRS/Tower connects to the AP via an Ethernet LAN or Token Ring LAN. The MRS/Tower connects to the PSTN via either Loopstart or T1 lines.

Steps for physical installation of the system

Installation roadmap

To install the MRS/Tower, complete the steps in the following roadmap:

Installation roadmap		
Step	**What to do**	**How to do it**
1	Remove the MRS/Tower and peripherals from the packaging.	“Removing components from packaging” on page 7-2.
2	Verify that you have all of the necessary components for the installation.	“Checklist — necessary components for the installation” on page 7-2.
3	Remove the cover from the MRS/Tower.	“Removing the chassis cover of the MRS/Tower” on page 7-3.
4	Check to make sure that all cards, boards, and cable connectors are seated properly.	“Inspecting the chassis” on page 7-5.
5	Replace the MRS/Tower covers.	“Replacing the chassis cover” on page 7-6.

Installation roadmap		
Step	**What to do**	**How to do it**
6	Connect the keyboard.	“Adding peripherals to the MRS/Tower” on page 7-6.
7	Add the external modem.	“Adding a modem for Remote Access Service (RAS)” on page 7-8.
8	Connect the MRS/Tower to the LAN.	“Connecting the cables to the LAN” on page 7-8.
9	Connect the telephony cables to the MRS/Tower.	“Connecting the telephony lines” on page 7-8.
10	Connect the optional UPS cable to the MRS/Tower.	Chapter 9, “Uninterruptible Power Source (UPS) option.”
11	Power up the system.	“Powering up the system” on page 7-9.
12	Check the license file.	“Checking the license file” on page 7-10
13	Perform final steps.	“Final installation steps” on page 7-11.

Removing components from packaging

When removing the MRS/Tower, optional hardware, and peripherals from the shipping cartons, use the checklist below to confirm that you have received everything required to install your system.

Place the monitor and optional UPS in the preplanned location and continue with the steps to install the MRS/Tower.

Checklist — necessary components for the installation

Before you begin, make sure that you have all hardware components necessary for installing your MRS/Tower. Use the following checklist as a guide.

Component checklist	✔
Base system	
MRS/Tower	

Component checklist	✔
MRS/Tower power cable	
Monitor	
Monitor power cable and cable to connect monitor to the MRS/Tower	
Keyboard and keyboard cables	
U.S. Robotics Sportster 33.6 Kbps external modem (North America and some Caribbean and Latin American countries only)	
System options	
Uninterruptible Power Source (UPS) (optional)	
Cable to connect optional UPS to the MRS/Tower	

Removing the chassis cover of the MRS/Tower

Introduction

You need to remove the chassis cover to access the system hardware. You should remove the cover before performing any maintenance or installation procedures.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

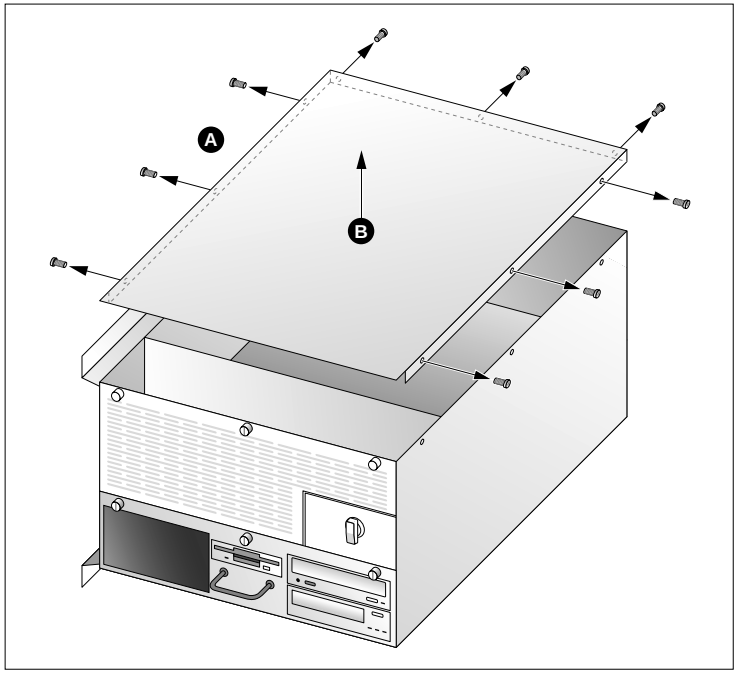
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Requirements

Before removing the cover, gather the following tools:

- Phillips-head screwdriver
- ESD wrist strap

Figure 7-1: Removing the chassis cover



To remove the chassis cover, follow these steps.

1. If the MRS/Tower is powered on, shut it down and then power down the MRS/Tower. (For more information on shutting down the MRS/Tower, see “Shutting down the MRS” on page 2-8.)
2. Unplug the AC power cord from the chassis and the AC outlet.
3. Turn the MRS/Tower on its side so that the media tray is at the bottom and the cover is on top.
4. Remove the nine Phillips-head screws that secure the cover. When the MRS/Tower is on its side, three screws are on the left and right sides and three are at the rear of the chassis.
5. Remove the chassis cover by pulling the cover toward the rear of the chassis, then lifting it up and off.
6. Remove the two Phillips-head screws that hold the card retaining arm.
7. Remove the card retaining arm.

Inspecting the chassis

To ensure that the system components are connected properly, you should perform a visual check for loose boards or foreign matter in the chassis. Be sure to inspect the chassis before you continue with the installation.

To inspect the chassis, follow these steps.

1. Remove the chassis cover as described in “Removing the chassis cover of the MRS/Tower” on page 7-3.
2. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
3. Carefully check all cards to ensure they are fully seated on the baseboard.
4. Check that the SCbus cable is connected to all telco and option cards.
5. Check for any loose wires or foreign objects, such as loose screws, inside the chassis.
6. Replace the card retaining arm.
7. When you finish your inspection, remove the ESD clip and reinstall the cover.

Replacing the chassis cover

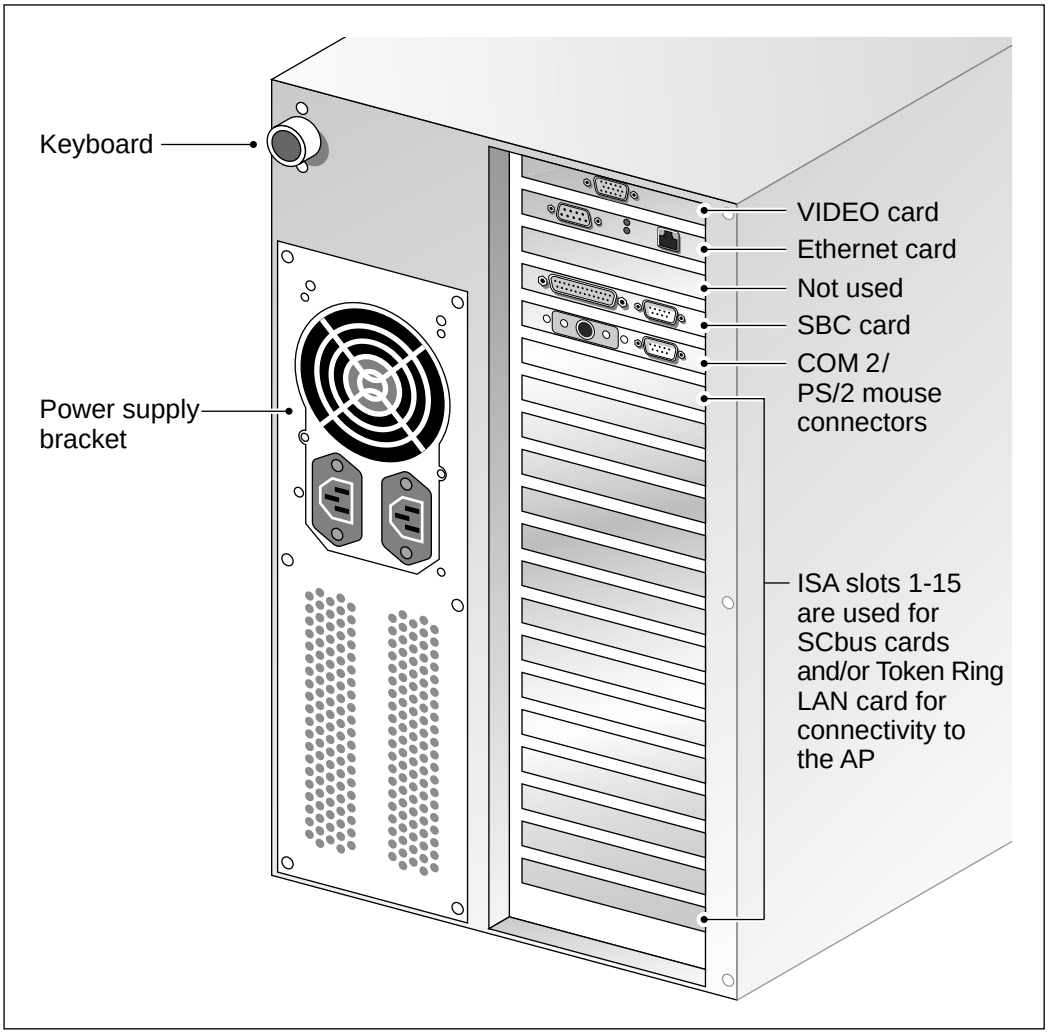
1. Replace the card retaining arm, and screw it into place.
2. Replace the chassis cover by placing it on the machine and sliding it toward the front of the machine
3. Replace the nine Phillips-head screws. When the MRS/Tower is viewed on its side, three are on the rear and three are on each side.
4. Turn the MRS/Tower upright.
5. Plug the AC power cord into the chassis and the AC outlet.

Adding peripherals to the MRS/Tower

A legend is located adjacent to the peripheral connector panel at the back of the MRS/Tower. This legend shows the symbol for each peripheral and which connector to use.

> ***Note:*** Symposium OPEN IVR 4.0 only supports network printers. Printer configuration is a UNIX procedure and is independent of Symposium OPEN IVR 4.0.

Figure 7-2: Rear panel connections


Keyboard
Power supply bracket
VIDEO card
Ethernet card
Not used
SBC card
COM 2/ PS/2 mouse connectors
ISA slots 1-15 are used for SCbus cards and/or Token Ring LAN card for connectivity to the AP

Note 1: You should not add other peripheral devices to your MRS/Tower. Other peripherals, including printers, are not supported by Nortel.

Note 2: If a Madge ISA Token Ring card is used as the IVR LAN card, then the Ethernet card is not required.

To connect peripherals and the power cord to the MRS/Tower, follow these steps.

1. Ensure the machine is not plugged into a power source.
2. Plug the keyboard connector into the keyboard DIN connector at the rear of the chassis.
3. Connect the License Manager security keylock to the parallel port on the SBC card. The security keylock is labeled to indicate the corresponding server.
4. Plug in the monitor connector. Tighten the screws on the connector.
5. Plug the monitor power cord into a wall receptacle or power bar. Do not turn on the monitor at this time.

   Note: *Do not* turn on the MRS/Tower at this time.

Adding a modem for Remote Access Service (RAS)

When you add a modem to your MRS/Tower, you can access the MRS from a remote service PC. Remote access enables you to perform many activities remotely, including maintenance and diagnostics.

For modem installation instructions, see Chapter 11, "Remote access."

Connecting the cables to the LAN

Connect the LAN cables. For information on connecting the MRS to the LAN, see Chapter 17, "LAN card installation."

Connecting the telephony lines

Connect the telephony lines to the MRS. For information on the telephony cards in the MRS, see "Telco interface card installation" on page 19-1.

Connecting the UPS cable

If the UPS was ordered for your system, connect the UPS computer interface cable from the Computer Interface Port (DB9 connector) on the rear panel of the UPS to COM port 2 on the rear panel of the MRS/Tower. For more information on the UPS and its installation, refer to Chapter 9, "Uninterruptible Power Source (UPS) option."

Powering up the system

Connecting the MRS/Tower to the AC power source

To connect the MRS/Tower to the AC power source, follow these steps.

1 Check the AC grounding receptacle power source for the power properties.

- **a** Using a voltmeter, check the voltage from the ground to the primary lead. You should obtain the standard input voltage.
- **b** Using a voltmeter, check the voltage from the ground to the neutral lead. The reading should be .5 volts or less.
- **c** Using an ohmmeter, verify the resistance from the ground to neutral. The reading should be less than .25 ohms.

2 Connect the MRS/Tower to an isolated grounding receptacle power source.

- **a** Attach the power cable to the power inlet on the rear of the MRS/Tower.
- **b** Plug the other end of the power cable into the wall outlet, or the UPS.
- **c** If the MRS/Tower powers up when it is plugged in, turn the MRS/Tower off.
- **d** Use tie-wraps to secure the cables to the MRS/Tower chassis, if possible. Doing this helps the MRS/Tower cable connections to remain stable if the MRS/Tower is moved.

3 If the UPS was ordered, follow these steps.

- **a** Turn on the UPS. Press the On/Test button for one second.

  The UPS will beep and then perform a self-test. The UPS simulates a blackout and switches to on-battery operation. This is the SELF TEST feature which ensures that the UPS is working properly and that its battery does not need replacing. This test will last another 8 to 10 seconds and completes when the On Line light stops flashing.
- **b** Check that the Site Wire Fault light is *not* lit. If it is lit, notify the site administrator that a qualified electrician needs to check the outlet for incorrect grounding (for example, voltage potential exists between the neutral and ground wire).

Turning on the MRS/Tower

1. Turn on the MRS/Tower monitor by pressing the monitor power switch ON.
2. Turn on the MRS/Tower by pressing the MRS/Tower power switch ON.
3. A Keyboard Detected message should display on the monitor when the MRS/Tower senses the device. If it does not, power off and check the keyboard connections.
4. A SCSI ID #0 Seagate, and SCSI ID #2 Seagate message should display when the MRS/Tower senses these disk and tape devices. If they do not, power off and check the connections of these devices.

   When the BOOT: prompt appears, do *not* touch the keyboard. Wait for the system to automatically boot in about 60 seconds.
5. Verify the date, time and time zone.

   a. Log in to the MRS as `root`.

   b. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

   The `/sci/maint>shell` option accesses a UNIX shell from which you can enter UNIX commands.

   c. Type **`date`** and press <Enter>.

   d. Verify that the date, time, and time zone are correct. (If the date is incorrect, see “Changing the system date” on page 2-11; if the time zone is incorrect, see “Changing the system time zone” on page 2-11.)

   e. Type **`exit`** to leave the UNIX shell.

   f. Type **`done`** until you reach the main SCI menu.

   g. Type **`quit`** to log out of the SCI.

Checking the license file

You may want to check the license file to verify current licensing information. To check the license file on the MRS, follow these steps.

1. Log in to the MRS as `service`.
2. At the `/sci` prompt, type **`admin license active`**.

   The system displays the license file information.

Final installation steps

1. Verify the modem connection. See “Remote login to the SCI” on page 11-6.
2. Verify the LAN connection. See “Verifying the communication link” on page 23-19 for information on verifying the LAN connection.
3. Verify the telephony connections.
4. Perform a full system image backup of all new APs and MRSs that have been installed to be stored by the distributor. See “Creating a system image backup” on page 15-4. The original system image backup tape that is shipped with the system should be stored on site in a safe place.
5. Keep the Symposium OPEN IVR 4.0 documentation with the IVR system.

Chapter 8: MRS/Rack installation

Overview

When the MRS/Rack is installed, it is positioned between the AP and the PSTN. The MRS/Rack connects to the AP via an Ethernet LAN or Token Ring LAN. The MRS/Rack connects to the PSTN via either Loopstart or T1 lines. Power is provided to the MRS/Rack by AC or DC.

Steps for physical installation of the system

Installation roadmap

To install the MRS/Rack, complete the following steps:

Installation roadmap		
Step	**What to do**	**How to do it**
1	Remove the MRS/Rack and peripherals from the packaging.	"Removing components from packaging" on page 8-2.
2	Verify that you have all of the necessary components for the installation.	"Checklist — necessary components for the installation" on page 8-3.
3	Install the optional cabinet.	Appendix C, "Installing the cabinet and rack-mountable components."
4	Remove the cover from the MRS/Rack.	"Removing the chassis cover of the MRS/Rack" on page 8-4.
5	Check to make sure that all cards, boards, and cable connectors are seated properly.	"Inspecting the chassis" on page 8-5.

Installation roadmap		
Step	**What to do**	**How to do it**
6	Replace the MRS/Rack covers.	“Replacing the MRS/Rack chassis cover” on page 8-6.
7	Install the power supply module(s) into the MRS/Rack if they were shipped uninstalled	“Replacing the power supply” on page 21-36
8	Install the MRS/Rack into the cabinet	Appendix C, “Installing the cabinet and rack-mountable components.”
9	Connect the keyboard.	“Connecting peripherals” on page 8-6.
10	Add the external modem.	“Adding a modem for Remote Access Service (RAS)” on page 8-9.
11	Connect the MRS/Rack to the LAN.	Chapter 17, “LAN card installation."
12	Connect the telephony lines to the MRS/Rack.	Chapter 19, “Telco interface card installation."
13	Connect the UPS cable to the MRS/Rack.	“Connecting the UPS cable” on page 8-9.
14	Power up the system.	“Powering up the system” on page 8-10.
15	Check the license file.	“Checking the license file” on page 8-12
16	Perform final steps.	“Final installation steps” on page 8-12.

Removing components from packaging

When removing the MRS/Rack, optional hardware, and peripherals from the shipping cartons, use the checklist that follows to confirm that you have received everything required to install your system.

Place the monitor and optional UPS in the preplanned location, and continue with the steps to install the MRS/Rack.

Checklist — necessary components for the installation

Before you begin, make sure that you have all hardware components necessary for installing your MRS/Rack. Use the following checklist to as a guide.

Component checklist	✔
Base system	
MRS/Rack	
MRS/Rack power cable (for AC version only)	
Power supply module(s), which may be shipped uninstalled	
Monitor	
Monitor power cable and cable to connect monitor to the MRS/Rack	
Keyboard and keyboard cable	
U.S. Robotics Sportster 33.6 Kbps external modem (North America and some Caribbean and Latin American countries)	
Modem cables	
System options	
Rack cabinet (optional)	
Uninterruptible Power Source (UPS) (optional)	
Cable to connect optional UPS to the MRS/Rack	

Installing the cabinet (optional)

If the optional cabinet was ordered for your installation, install it in the preplanned location before you begin the other steps. See Appendix C, “Installing the cabinet and rack-mountable components.”

Removing the chassis cover of the MRS/Rack

Description

Removing the cover enables you to access the 16 ISA/1 SBC/3 PCI Slot passive backplane for performing any maintenance activities.

Gathering the tools

Before removing the cover, gather the following tools:

- flat-blade screwdriver
- ESD wrist strap

Removing the top cover

To remove the top cover, follow these steps.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 If the MRS/Rack is powered on, shut it down and then power down the MRS/Rack. (For more information on shutting down the MRS/Rack, see “Shutting down the MRS” on page 2-8.)

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

2 Loosen the three thumbscrews at the rear of the top cover.

3 Remove the top cover by pulling the cover toward the rear of the chassis, then lifting it up and off.

Inspecting the chassis

Introduction

To ensure that the system components are connected properly, you should perform a visual check for loose boards or foreign matter in the chassis. Be sure to inspect the chassis before you continue with the installation.

Note: Use the following steps to inspect the chassis. If any options were not installed at the factory, this would be the appropriate time to install them.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1. Remove the screws securing the side panel or main cover of the chassis.
2. Remove the cover.
3. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
4. Carefully check all cards to ensure they are fully seated on the baseboard.
5. Check that the SCbus cable is connected to all telco and option cards.
6. Check for any loose wires or foreign objects, such as loose screws, inside the chassis.
7. If installed on your MRS/Rack, check that the cross bars holding the CPU board and memory board in place are secure.
8. When you finish your inspection, remove the ESD clip and reinstall the cover. Secure the cover with the screws.

Replacing the MRS/Rack chassis cover

To replace the chassis cover, follow these steps.

1 Place the top cover at the rear of the chassis, and slide the cover down and over the chassis toward the front of the MRS/Rack.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

2 Once the cover is in place, tighten the three thumbscrews at the rear of the top cover.

3 Reconnect all power cords.

Installing the power supply module(s) in the MRS/Rack

If the power supply module(s) were shipped uninstalled, install them now. For instructions, see “Replacing the power supply” on page 21-36.

Installing the MRS/Rack in the cabinet

If a cabinet was purchased for the MRS/Rack, then refer toAppendix C, “Installing the cabinet and rack-mountable components.”

Connecting peripherals

Note: For an MRS/Rack that has been installed in a cabinet, leave enough slack on the cables so that the server or a peripheral can be pulled away from the cabinet if necessary for servicing without disconnecting any cables.

Introduction

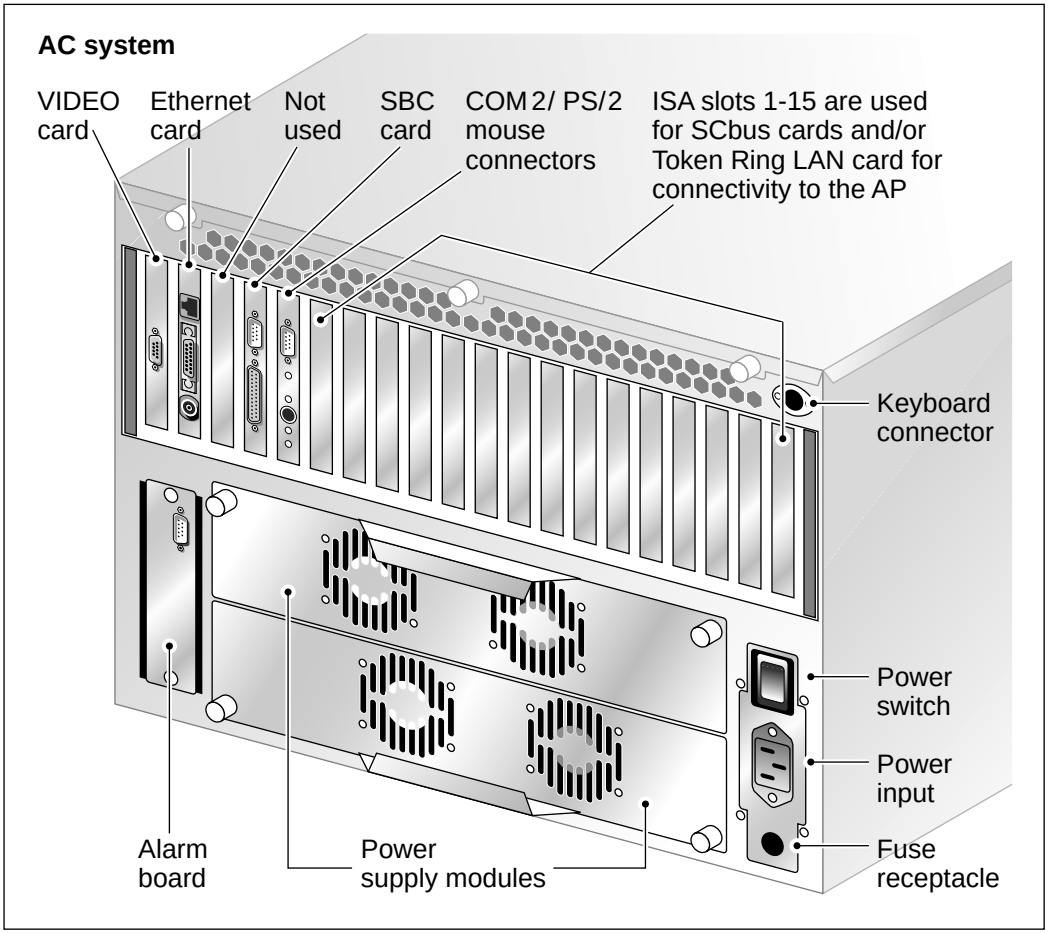
You will need to add peripheral devices to your MRS/Rack. This procedure aids in installing the keyboard and monitor.

Note: Symposium OPEN IVR 4.0 only supports network printers. Printer configuration is a UNIX procedure and is independent of Symposium OPEN IVR 4.0.

Before you begin

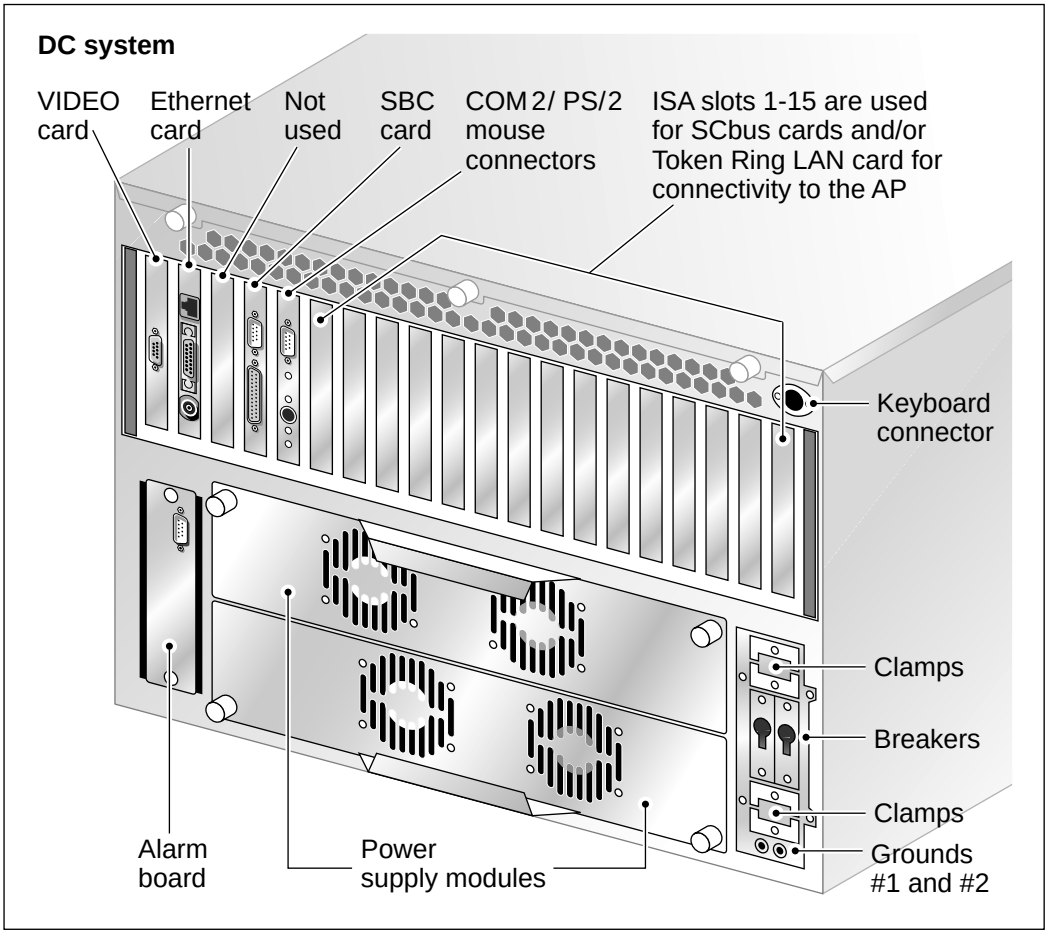
A legend is located adjacent to the peripheral connector panel at the back of the MRS/Rack. This legend shows the symbol for each peripheral and which connector to use.

Figure 8-1: Rear panel connections for MRS/Rack (AC power)



Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then the Ethernet card is not required.

Figure 8-2: Rear panel connections for MRS/Rack (DC power)



Note: If a Madge ISA Token Ring card is used as the IVR LAN card, then the Ethernet card is not required.

Other peripheral devices

You should not add other peripheral devices to your MRS/Rack. Other peripherals, including printers, are not supported by Nortel.

Connecting peripheral devices

To connect peripherals and the power cord to the MRS/Rack, follow these steps.

1. Ensure the machine is not plugged into a power source.
2. Plug the keyboard connector into the keyboard DIN connector at the rear of the chassis.
3. Connect the License Manager security keylock to the parallel port on the SBC card. The security keylock is labeled to indicate the corresponding server.
4. Plug in the monitor connector. Tighten the screws on the connector.
5. Plug the monitor power cord into a wall receptacle or power bar. Do not turn on the monitor at this time.

   Note: *Do not* turn the MRS/Rack on at this time.

Adding a modem for Remote Access Service (RAS)

When you add a modem to your MRS/Rack, you can access the MRS by a remote service PC. RAS enables you to perform many activities remotely, including maintenance and diagnostics. RAS is required for Nortel support.

For modem installation instructions, see Chapter 11, "Remote access."

Connecting the cables to a LAN

Connect the LAN cables. For information on connecting the MRS to the LAN, see Chapter 17, "LAN card installation."

Connecting the telephony lines

Connect the telephony lines to the MRS. For information on the telephony cards in the MRS, see "Telco interface card installation" on page 19-1.

Connecting the UPS cable

If the UPS was ordered for your system, connect the UPS computer interface cable from the Computer Interface Port (DB9 connector) on the rear panel of the UPS to COM port 2 on the rear panel of the MRS/Rack. For more information on the UPS and its installation, refer to Chapter 9, "Uninterruptible Power Source (UPS) option."

Powering up the system

Connecting the MRS/Rack to the AC power source

To connect the MRS/Rack to the power source, follow these steps.

1 Check the AC grounding receptacle power source for the power properties.

- **a** Using a voltmeter, check the voltage from the ground to the primary lead. You should obtain the standard input voltage.
- **b** Using a voltmeter, check the voltage from the ground to the neutral lead. The reading should be .5 volts or less.
- **c** Using an ohmmeter, verify the resistance from the ground to neutral. The reading should be less than .25 ohms.

2 Connect the MRS/Rack to an isolated grounding receptacle power source.

- **a** Attach the power cable to the power inlet on the rear of the MRS/Rack.
- **b** Plug the other end of the power cable into the wall outlet or the UPS.
- **c** If the MRS/Rack powers up when it is plugged in, turn the MRS/Rack off.
- **d** Use tie-wraps to secure the cables to the MRS/Rack chassis, if possible. Doing this helps the MRS/Rack cable connections to remain stable if the MRS/Rack is moved.

3 If the UPS was ordered, follow these steps.

- **a** Turn on the UPS. Press the On/Test button for one second.

  The UPS will beep and then perform a self-test. The UPS simulates a blackout and switches to on-battery operation. This is the SELF TEST feature which ensures that the UPS is working properly and that its battery does not need replacing. This test will last another 8 to 10 seconds and completes when the On Line light stops flashing.
- **b** Check that the Site Wire Fault Indicator on the rear panel of the UPS is *not* lit. If it is lit, notify the site administrator that a qualified electrician needs to check the outlet for incorrect grounding (for example, voltage potential exists between the neutral and the ground wire).

Connecting the MRS/Rack to the optional DC power source

The MRS/Rack is available in either an AC or a DC version. In the DC version it will be connecting to at least one –48 V DC power source on the MRS/Rack. If the MRS/Rack was ordered with redundant power supplies, two power sources (an A and a B –48 V DC power source) can be connected to the MRS/Rack.

To connect the MRS/Rack to a DC power source, follow these steps.

1. Check he DC power source by verifying that –48 V DC is measured on the DC power leads.
2. Using a Phillips screwdriver, loosen the cable lock screws on the rear panel. (If the redundant DC power option is installed, there will be two power inputs.)
3. Connect the –48 V DC power source. (If the DC power redundancy option is installed, you must connect both sources.)
4. Tighten the cable lock screws to secure the connectors.
5. Connect the ground wires to the ground terminals at the bottom of the panel, with the primary source grounded on the left terminal and the secondary source grounded on the right terminal.

   Note: If the AP has *not* been installed, perform the AP installation method before continuing in this process.

Turning on the MRS/Rack

1. Turn on the MRS/Rack monitor by pressing the monitor power switch ON.

   Note: To access the controls of a monitor that is installed in a cabinet for the MRS/Rack, you may need to remove the front panel of the monitor enclosure. See “Monitor enclosure” on page C-6.

2. Turn on the MRS/Rack by pressing the MRS/Rack power switch ON.
3. A Keyboard Detected message should display on the monitor when the MRS/Rack senses this device. If it does not, power off and check the keyboard connections.
4. A SCSI ID #0 Seagate, and SCSI ID #2 Seagate message should display when the MRS/Rack senses these disk and tape devices. If they do not, power off and check the connections of these devices.

   When the `BOOT:` prompt appears, do *not* touch the keyboard. Wait for the system to automatically boot in about 60 seconds.

5 Verify the date, time, and time zone.

a Log in to the MRS as `root`.

b At the `/sci` prompt, type **`maint shell`** and press <Enter>.

The `/sci/maint>shell` option accesses a UNIX shell from which you can enter UNIX commands.

c Type **`date`** and press <Enter>.

d Verify that the date, time, and time zone are correct. (If the date is incorrect, see “Changing the system date” on page 2-11; if the time zone is incorrect, see “Changing the system time zone” on page 2-11.)

e Type **`exit`** to leave the UNIX shell.

f Type **`done`** until you reach the main SCI menu.

g Type **`quit`** to log out of the SCI.

Checking the license file

You may want to check the license file to verify current licensing information. To check the license file on the MRS, follow these steps.

1 Log in to the MRS as `service`.

2 At the `/sci` prompt, type **`admin license active`**.

The system displays the license file information.

Final installation steps

1 Verify the modem connection. See “Remote login to the SCI” on page 11-6.

2 Verify the LAN connection. See “Verifying the communication link” on page 23-19 for information on verifying the LAN connection.

3 Verify the telephony connections.

4 Perform a full system image backup of all new APs and MRSs that have been installed to be stored by the distributor. See “Creating a system image backup” on page 15-4. The original system image backup tape that is shipped with the system should be stored on site in a safe place.

5 Keep the Symposium OPEN IVR 4.0 documentation with the IVR system.

Chapter 9: Uninterruptible Power Source (UPS) option

Overview

The Uninterruptible Power Source (UPS) option prevents spikes, blackouts, sags, and surges from affecting the normal operation of the AP, MRS/AP, or MRS. The UPS option filters out small utility line fluctuations and isolates the servers from large disturbances by internally disconnecting the server from your facility's power line and continuing to supply power from its internal batteries until the utility power returns to normal.

By connecting the UPS to your servers with a special Nortel communications cable, you can take full advantage of the features offered by the UPS option.

> ***Note:*** This chapter provides information to supplement the information provided with your UPS.

UPS models supported

Nortel uses American Power Conversion's Smart–UPSs to support the AP, MRS/AP, and MRS units. 220V UPS or the 110V UPS models are available.

For additional information on the APC Smart-UPS, refer to the APC Smart-UPS documentation supplied with your UPS.

Release 2 hardware platforms

For UPS installation on a Release 2 MRS/Tower or MRS/Rack, do the following:

1. Perform physical installation as described in the *Nortel IVR 2.0/S Installation and Maintenance Guide*.
2. Log in to the MRS as `root`.
3. At the `/sci` prompt, type **`setup syscfg`** and press <Enter>.

   The syscfg option allows you to modify system configuration settings, including enabling the UPS.
4. Press <Enter> to accept the defaults for all other parameters. At the UPS prompt, type **`enabled`** and press <Enter>.

Note: The Powerchute software is not required on Release 2.x MRS/Tower or MRS/Rack. The installation procedures in this chapter apply to Release 4 hardware platforms plus Release 2 AP and MRS/AP servers.

Event behavior

AP

In brownouts and power spikes, the UPS hardware is able to adjust without relying on the battery, allowing the AP to continue without power fluctuation. The system will operate in this mode indefinitely, but it will log an event showing a brownout has occurred.

If the power is lost, the battery is expected to supply power to the AP for some extended period; this time period depends on the size of the UPS and the power requirements of the system being protected. The UPS will monitor the load of the system being protected and the capacity of the battery, and will initiate a UNIX shutdown on the AP just before the battery is drained.

MRS

When the MRS's UPS detects the loss of utility power, it switches to battery power. While running on battery power, the UPS intermittently beeps to notify maintenance personnel of the power failure. You can press the On/Test button to silence the alarm.

If the utility line power remains off and the battery continues to power the MRS, eventually a low-battery shutdown will occur. An advance warning of a battery-low condition will begin approximately two minutes prior to the UPS's final shutdown. The alarm on the front panel of the UPS changes to a continuous beeping sound that cannot be disabled, even if you press the On/Test button. At this time, the MRS is shut down gracefully.

Preparing for UPS installation

The UPS option is provided to protect your system from power failure. An APC Smart-UPS series UPS and PowerChute *plus* v4.2.2 for SCO UNIX UPS management software are selected for Symposium OPEN IVR 4.0.

This chapter briefly describes the installation and setup procedures for the UPS option. Nortel recommends that you read the PowerChute *plus User's Guide* for more detailed information.

Safety issues

DANGER

Risk of electric shock

This UPS device contains voltages that are potentially hazardous. All repairs should be performed by trained service personnel. The UPS contains its own energy source (battery), and the output cords may be live even when the UPS is not connected to an AC source.

The safe use of the UPS depends in part on the care you take. To ensure safe use, you should observe the following precautions:

- Never attempt to disassemble the UPS. You could be exposed to dangerous voltages.
- Do not attempt to power the UPS from any receptacle except a 2-pole, 3-wire grounding receptacle. Connection to any other type of receptacle may result in a shock hazard and might violate local electrical codes.
- In selecting a location for the UPS, avoid places where there is water or excessive humidity.
- Do not allow water or any foreign object to get inside the UPS. Do not place small objects or anything containing liquid on or near the unit.
- To minimize the risk of overheating, avoid placement where the UPS will be exposed to the direct rays of the sun or near heat-emitting devices.

Package contents

PowerChute *plus* contains the following:

- PowerChute *plus* User's Guide
- software CD-ROM — "Symposium OPEN IVR 4.0, UPS software, CD 1 of 1"
- one black 940-0024C serial cable for Smart-Signaling (provided with the UPS)

System requirements

A serial port has to be dedicated to the UPS. In Symposium OPEN IVR Release 4.0, COM 2 port 2 (/dev/tty2a) is dedicated for the UPS if the UPS option is chosen. The PowerChute *plus* software supports, but does not require, a mouse. It can run a text-based interface.

Installing the APC UPS on the AP or MRS/AP

Note: PowerChute *plus* must be installed by the system administrator or someone with super-user (root) privilege. PowerChute *plus* software must also be installed on a local file system, not a mounted file system, because the files in the PowerChute *plus* directory need to be available to the operating system after all the mounted file systems have been unmounted. PowerChute *plus* should be installed under the root file system, not under /u directory.

To install the UPS and the PowerChute *plus* software on the AP or MRS/AP, follow these steps.

1 Ensure that the AP or MRS/AP is shutdown. See “Shutting down the AP or MRS/AP” on page 2-7.

2 Power off the AP or MRS/AP.

3 Plug the AP or MRS/AP power cord into the UPS.

4 Plug the UPS power cord into a power outlet.

5 Select the special black 940-0024C serial cable (not a standard serial cable) to connect the UPS to the COM2 port of the AP or MRS/AP.

6 Turn on the UPS.

7 Power up the AP or MRS/AP.

8 Log in to the AP or MRS/AP as `root`.

9 At the # prompt, type **`disable tty2a`** and press <Enter>. This step disables the serial login for COM 2 and allows it to be dedicated to the UPS.

Note: It is critical that the COM 2 port (tty2a) is fully dedicated. No other process should access this port, or the PowerChute *plus* software will behave unpredictably and could cause harm to the server.

10 Go to “PowerChute plus software installation on the AP, MRS/AP, or MRS” on page 9-7.

Installation of APC UPS on the MRS

To install the UPS and the PowerChute *plus* software on the MRS, follow these steps.

1. Ensure that the MRS is shutdown. See “Shutting down the MRS” on page 2-8.
2. Power off the MRS.
3. Plug the MRS’s power cord into the UPS.
4. Plug the UPS power cord into a power outlet.
5. Select the special black 940-0024C serial cable (not a standard serial cable) to connect the UPS to the COM2 port of the MRS.
6. Turn on the UPS.
7. Power up the MRS.
8. Log in to the MRS as `root`.
9. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
10. At the # prompt, type **`disable tty2a`** and press <Enter>. This step disables COM 2 and allows it to be dedicated to the UPS.

    Note: It is critical that the COM 2 port (tty2a) is fully dedicated. No other process should access this port, or the PowerChute *plus* software will behave unpredictably and could cause harm to the server.

11. Go to “PowerChute plus software installation on the AP, MRS/AP, or MRS” on page 9-7.

PowerChute *plus* software installation on the AP, MRS/AP, or MRS

1. Insert the CD-ROM, labeled "Symposium OPEN IVR 4.0, UPS software, CD 1 of 1" into the CD-ROM drive.

   Note for MRS installations:
   If a CD-ROM drive is installed on the MRS, insert the CD-ROM into the MRS CD-ROM drive. Otherwise, insert the CD-ROM into the CD-ROM drive on the AP.

2. For an MRS installation from a CD-ROM on the AP, ensure that the `hosts` and `rhosts` files are up to date on the AP and MRS. See Chapter 13, "Host name and IP address change."

3. At the # prompt, type **`scoadmin`** and press <Enter>.

4. Create a SCO user account named **`pwrchute`**. Accept all the default settings for the account.

   Note: It is optional to set a password for the `pwrchute` account. If you do not set a password, you only need to enter press <Enter> for the password when you log in to the `pwrchute` account.

5. Exit **`scoadmin`**.

6. Type **`cd /scripts`** and press <Enter>.

7. Type **`./install.apc`** and press <Enter>.

   The following is displayed:

   ```
   1. From localhost to localhost

   2. Remote install from AP to MRS

   Enter 1 or 2 or q to quit:
   ```

8. For an AP or MRS/AP UPS installation, type **1** and press <Enter>.

   Note for MRS installations:
   If you are installing from a CD-ROM drive on the MRS, type **1** and press <Enter>.

   If you are installing from a CD-ROM drive on the AP, type **2** and press <Enter>.

9 After you press <Enter>, some screen messages are displayed, followed by this prompt:

```
   1) CD-ROM
   2) Floppy
   3) Tape

Select the media type from which you will
install: [?]
```

10 Type **1** to select CD-ROM.

The following prompt is displayed:

```
Enter path to mounted CD ROM [/scripts]
```

11 Type **/mnt** and press <Enter>.

The following prompt is displayed:

```
Would you like to see an overview of the
Installation? [y/n,q]
```

12 Type **n** and press <Enter>.

Some screen messages are displayed, followed by this prompt:

```
   1) User Interface Module Only
   2) Daemon Module Required for UPS Monitoring
Only
   3) Both the User Interface and Daemon Modules

Which Parts of PowerChute Plus for Unix do you
wish to install? [?]
```

13 Type **3** and press <Enter> to install both the User Interface and Daemon Module.

The following prompt is displayed:

```
   1) Matrix-UPS
   2) Smart-UPS
   3) Back-UPS

Which APC Hardware will PowerChute Plus for Unix
```

```
be running with [?]
```

14 Type **2** and press <Enter>.

Some screen messages are displayed, followed by this prompt:

```
Do you currently have a Measure-UPS attached to
the UPS? [y/n,q]
```

15 Type **n** and press <Enter>.

A list of operating systems is displayed, followed by this prompt:

```
On which Operating System are you installing? [?]
```

16 Type **6** and press <Enter> to select SCO UNIX.

Some screen messages are displayed, followed by this prompt:

```
Do you currently have TCP/IP Installed? [y/n,q]
```

17 Type **y** and press <Enter>.

Some screen messages are displayed, followed by this prompt:

```
   1) Use Default Color scheme
   2) Use Monochrome Color scheme

Which color scheme do you wish to use [1]?
```

18 Press <Enter> to select the Default Color Scheme.

Some screen messages are displayed, followed by this prompt:

```
   1) /dev/tty1a
   2) /dev/tty2a
   3) Other

Which serial device will be dedicated to
PowerChute Plus for Unix [?]
```

19 Type **2** and press <Enter> to select `/dev/tty2a`.

A screen message prompts you to verify that the UPS cable is connected to `/dev/tty2a` (COM 2 port).

20 Next, if the installation script detects an earlier version of PowerChute *plus*, it will prompt you as to whether you would like to remove it from the system before installing the new version. Any 3.x version of PowerChute *plus* must be removed before continuing.

Next, some screen messages are displayed, followed by this prompt:

```
Where do you wish to install PowerChute Plus for
Unix?[/usr/lib/powerchute]
```

21 Type **`/powerchute`** and press <Enter>.

The installation script presents a screen that shows all your configuration options, followed by this prompt:

```
Are the above selections correct? [y/n,q]
```

22 If you have responded to each prompt as instructed, the selections are correct. Type **`y`** and press <Enter>.

Screen messages are displayed as the installation of PowerChute Plus begins.

If the installation and initial communication with the UPS is OK, the message `UPS communication on /dev/tty2a verified` is displayed. Otherwise, check the cable connection at the UPS and IAP, MRS/AP, or MRS.

23 Remove the CD-ROM from the drive. If the CD-ROM appears stuck in the drive, type **`umount /mnt`** and press <Enter>. Then remove the CD-ROM.

24 Type **`shutdown -y -g0 -i6`** and press <Enter> to reboot the system and start the PowerChute daemon.

Installation summary

PowerChute *plus* makes the following changes during installation:

- creates the `/powerchute` directory to install PowerChute files
- copies PowerChute *plus* files to the system
- modifies/creates the following start-up and shutdown files:

Start-up Files	Shutdown File
(New) /etc/rc.d/7/upsd.boot	(Modify) /etc/rc0
(New) /etc/rc.APCupsd	

Setting up the UPS shutdown procedures

Setting up PowerChute *plus* software to support the 10 minutes kick-off of the shutdown process is done through running the utility `xpowerchute` on the AP or MRS/AP, or `powerchute` on the MRS. You have to log in to the system as root to execute the utility.

To run the powerchute utility, follow these steps.

1 Log in as `root`.

2 On an MRS, execute the following steps after logging in:

- **a** At the `/sci` prompt type **`maint shell`** and press <Enter>.
- **b** At the # prompt, type **`cd /powerchute`** to change to the powerchute directory.
- **c** Type **`./powerchute`** and press <Enter>.

3 On an AP or MRS/AP, execute the following steps after logging in:

- **a** At the # prompt, type **`cd /powerchute`** and press <Enter>.
- **b** At the prompt, type **`./xpowerchute &`** and press <Enter> to invoke the Main Screen X window interface.

4 Once you invoke the PowerChute *plus* Main Screen, go to the "Configuration/UPS Shutdown Parameters..." and set "UPS Low Battery Signal Time" parameter to 10 minutes.

5 Set "UPS Turn Off Delay" parameter to 20 seconds.

6 Click OK to save your changes.

7 Go to the menu Configuration/Event Actions option, and click UPS on Battery in the Events side of the dialogue window.

8 On the Actions for Selected Event side of the dialogue window, uncheck the Shut Down Server option checkbox.

This will ensure that the UPS is kept running while on battery without PowerChute *plus* shutting down your system.

9 Click 0K to save your changes.

10 Once the setup is done, exit the Main Screen interface and exit root.

These parameters cannot be changed by other users.

Verifying proper installation and operation

To verify that you have installed PowerChute *plus* correctly, follow the procedure below. This procedure should be run when there are no critical applications running on the system.

1 Disconnect the AP or MRS's power source. After a brief delay, the AP or MRS is notified of a power blackout.

2 Reconnect the power source. The AP or MRS is notified that power has been restored to the system.

3 Disconnect the power source again. The AP or MRS should again receive the message that a power failure has been detected.

4 Let the UPS system run on battery until low battery is reached. A "Low Battery Condition" event will be generated and logged. This event should happen when the system has 10 minutes of battery time. The UPS should initiate a UNIX shutdown sequence on the AP or MRS, and in about five minutes the AP or MRS shutdown process should be completed. Once the message
"Sending
U
U
S"
displays, the UPS will stop providing power to the AP or MRS after about 20 seconds.

5 Reconnect the power to the UPS. The UPS should turn back on and start providing power to the AP or MRS again. You may need to push the power button to restart the AP or MRS and UNIX.

6 Check the log file `powerchute.log` in the `/powerchute` directory to ensure that all the above events were recorded.

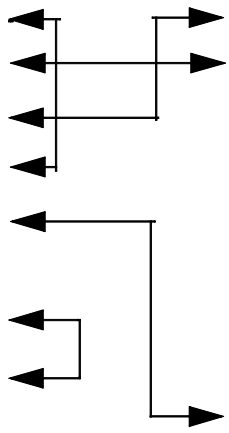
PowerChute *plus* 4.2.2 operational restriction

The Paging Modem option, accessed through the Communications Parameters menu, is not available in this release.

UPS cable pinouts

The following table provides the pinouts for the UPS cable that is supplied with the UPS.

Table 9-1: UPS cable pinout

DB9 Female to COM port 2		DB9 Male to UPS
1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9

PowerChute software *plus* features

With PowerChute plus software, you can configure your UPS to monitor multiple systems, log events, and configure system shutdown. The software also provides information on diagnostics, including

- testing a UPS
- scheduling UPS self tests
- performing and testing UPS calibrations

For information on these and other PowerChute *plus* features, refer to the PowerChute *plus* User's Guide.

Chapter 10: AP redundancy and replacing an AP or MRS/AP

Introduction

This chapter provides information for

- adding a secondary AP to your network for redundancy, in case of power or equipment failure
- replacing your current AP or MRS/AP

Adding a secondary AP

Having a redundant AP provides a fail-safe backup system. In a system configuration with two APs connected to an MRS, you can assign secondary (or redundant) status to an AP.

When an AP attempts to connect to the MRS, the MRS software considers the class of the AP. The four examples in Table 10-1 explain the connections and actions in an AP redundancy environment.

Table 10-1: Primary and secondary AP actions

Scenario 1	A primary AP attempts to connect to the MRS. No application servers are connected.
Action	MRS software resets the MRS. The primary AP gains control.

Scenario 2	A secondary AP attempts to connect to the MRS, and no other AP is connected.
Action	MRS software resets the MRS and waits approximately 90 seconds for a primary connection. The secondary AP gains control unless a primary AP tries to connect. If a primary AP attempts to make a connection in the first three minutes it gains control, the request from the secondary AP returns to the queue. If no other primary AP tries to connect, the MRS software gives control to the secondary AP. ***Note:*** If you restart the AP software before three minutes elapse (scenario 2), the secondary AP takes control again. Therefore, you must either reset the MRSs and the AP software, or reset the MRS and AP software.
Scenario 3	The primary AP is connected to the MRS. The secondary AP tries to connect.
Action	The primary AP remains in control. The MRS replies to the secondary AP that no trunks are available and places the secondary AP's request in a queue.
Scenario 4	The controlling AP disconnects from the MRS.
Action	The MRS waits for one of the APs to connect. An error message is placed in the event log.

Before assigning a secondary AP

This section provides information you must consider before assigning a secondary AP to your system.

Make sure the primary AP and MRS pair can maintain performance levels. That is, the AP must be able to maintain the performance of the secondary MRS plus the traffic from the primary MRS.

Configure the application servers consistently by ensuring the following:

- Adequate host connections and database servers are available on the secondary AP.

- Primary and secondary APs have the same applications, for example, adequate number of ports and host connections.

All calls in process during a switch-over are lost. Messages and faxes stored on one MRS are not available after a switch-over unless the MRSs share a common mounted-file system.

It is recommended that you use an Uninterruptible Power Source (UPS) in your system configuration. Refer to the *Site Planning Guide* or consult your sales representative for additional information.

Secondary AP installation and configuration

Physically installing a secondary AP is identical to installing a primary AP. To install a secondary AP, refer to the appropriate chapter for installation instructions (see Chapters 3 to 6), and then configure the secondary AP as described in the *System Administration Guide*.

Perform a full system image backup of the new AP to be stored by the distributor. See “Creating a system image backup” on page 15-4. The original system image backup tape that is shipped with the system should be stored on site in a safe place.

Defining the primary and secondary AP

The first AP listed in the hosts file on each MRS is treated as the primary AP.

Re-establishing a connection with the primary AP

A primary AP cannot take control from a secondary AP that is already connected. To reestablish the connection with the primary AP, do one of the following:

1. Reset the MRS and the attached AP manually. The MRS software searches for its primary AP.
2. Shut down the AP software on the current controlling AP. The MRS searches for the primary AP.

Replacing an AP or MRS/AP

Follow this procedure if you are replacing an AP or MRS/AP with a new one.

1. If the existing AP or MRS/AP is functional, perform a full backup of the AP or MRS/AP (see Chapter 15, “Backup and failure recovery”). If the AP or MRS/AP is disabled and you are unable to perform a full backup, then retrieve the latest backup tape.
2. Shut down and power down the existing AP or MRS/AP. See “Shutting down the AP or MRS/AP” on page 2-7.
3. Disconnect all peripherals, network connections, and UPS (if installed) from the AP or MRS/AP.
4. Replace the AP or MRS/AP with the new AP or MRS/AP.
5. Install the replacement AP or MRS/AP as indicated in the appropriate chapter from the following list:
   - Chapter 3, “Tower AP (300tp) installation
   - Chapter 4, “MRS/AP (300tp) installation
   - Chapter 5, “Tower AP (700tp) and Rack AP installation
   - Chapter 6, “MRS/AP (700tp) installation
6. Power up the replacement AP or MRS/AP.
7. Restore the data from the backup tape of the old AP or MRS/AP onto the new AP or MRS/AP. See Chapter 15, “Backup and failure recovery.”

Chapter 11: Remote access

Overview

This chapter describes the following:

- "Supported modems" on page 11-1
- "U.S. Robotics 28.8 and 33.6 Fax Modem settings" on page 11-3
- "Modem installation" on page 11-4
- "Uninstalling a modem" on page 11-5
- "Remote login to the SCI" on page 11-6
- "Remote login to the AP, MRS/AP, or MRS using PPP" on page 11-7
- "Using ZMODEM communication protocol for transferring files" on page 11-9

Supported modems

Customers in North America and some Caribbean and Latin American countries

Customers in North American and some Caribbean and Latin American countries receive a 33.6 US Robotics modem with each platform in a new Symposium OPEN IVR 4.0 system. Upgrade customers receive a 33.6 US Robotics modem for their AP or MRS/AP.

Nortel has certified the U.S. Robotics Sportster 9600/28.8/33.6 modems compatible.

US Robotics 14.4 modems are not compatible and therefore not included in this list.

Regional exceptions

Because of the different telephone network regulations throughout the world, customers outside of North America and some Caribbean and Latin American countries purchase modems through their local telephone service provider. The modem must be the equivalent of a U.S. Robotics Sportster 9600/28.8/33.6 for their installation.

U.S. Robotics 28.8 and 33.6 Fax Modem settings

The U.S. Robotics 28.8 and 33.6 Fax Modems are UL-recognized and fully FCC-, DOC- and CSA-certified modems with the following characteristics:

- high-speed, full duplex external data modem with V.34 transmission
- error control (V.42 and MNP 2-4)
- data compression (V.42 bis and MNP 5)

Set the switches on the modem as shown in Table 11-1.

Table 11-1: Modem settings

Switch	Modem settings	Function
1	OFF	Data Terminal Ready (DTR) Override OFF — Normal DTR operations: computer must provide DTR signal for modem to accept commands; dropping DTR terminates a call ON — Modem ignores DTR (Override)
2	OFF	Verbal/Numeric Result Codes OFF — Verbal (word) results ON — Numeric results
3	OFF	Result Code Display OFF — Results suppressed ON — Results enabled
4	ON	Command Mode Local Echo OFF — Keyboard commands displayed ON — Echo suppressed
5	OFF	Auto Answer Suppression OFF — Modem answers on first ring, or higher if specified in NVRAM ON — Auto answer disabled
6	OFF	Carrier Detect (CD) Override OFF — Modem sends CD signal when it connects with another modem, drops CD on disconnect ON — CD always ON (Override)

Switch	Modem settings	Function
7	ON	Power-on and ATZ Reset Software Defaults OFF — Load Y or Y1 configuration from user-defined nonvolatile memory (NVRAM) ON — Load &F0 - Generic template from read only memory (ROM)
8	ON	Command Set Recognition OFF — Command recognition disabled (Dumb mode) ON — Recognition enabled (Smart mode)

Modem installation

To allow remote access for support and maintenance, a modem must be attached to your Nortel system and the telephone network.

To add a modem to an AP, MRS, or MRS/AP, follow these steps.

1 Ensure that the modem switches are set as described in Table 11-1 on page 11-3.

2 Connect the large 25-pin male connector to the back of the modem.

3 Tighten the connector screws.

4 Connect the 9-pin female connector to COM port 1 on the SBC card backplate at the rear of the AP.

5 Tighten the connector screws.

6 Connect one end of the telephone cable to the modem RJ-11 jack labeled LINE.

7 Connect the other end of the telephone cable to the RJ-11 jack in the wall.

8 Connect the power cord to the modem, and plug the other end into a wall receptacle or power bar.

9 Turn the modem on.

Note: If you are installing a modem as part of a new installation or an upgrade from Release 2.x, then go to step 13. The settings in step 11 and step 12 are defaults on a new or upgraded system.

10 Log in to the server as `root`.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

11 At the # prompt, type **`disable tty1a`** and press <Enter>.

12 Type **`enable tty1A`** and press <Enter>.

13 Refer to the manufacturer's guide and perform the manufacturer's suggested test to ensure the modem is working properly.

Uninstalling a modem

1 Power off the modem.

2 Unplug the modem from the power source.

3 Disconnect the modem cable from the modem and the server.

4 Log in to the server as `root`.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

5 At the # prompt, type **`disable tty1A`** and press <Enter>.

Note: If you do not disable tty1A, error messages will appear on the console.

Remote login to the SCI

Remote login procedure

To use the modem to access the SCI, follow these steps:

1 If a modem is not already connected to the MRS or MRS/AP, then follow the steps in “Modem installation” on page 11-4.

2 At the remote location, set the terminal parameters as follows:

```
baud rate       38400
duplex          Full
data bits       8
stop bits       1
parity          none
add LF          off
```

3 From the remote location, dial in to the modem and wait for an answer. Once the modem is connected, press the <Enter> key. The following message should display:

```
<system name>
MRS Service Access PortRevision 4.00
Copyright 1991-1997, Nortel Corp. All Rights
Reserved
login:
```

4 At the `login:` prompt, enter the appropriate account name. The passwords for these accounts are listed in “Accounts and passwords” on page 2-2.

5 After you log in, the system prompts you for your terminal type. If the default terminal type displayed is correct, press <Enter>; otherwise, type in the correct terminal type (for example, vt100 or ansi).

Once this is completed, the SCI main menu is displayed.

Note: On an MRS/AP, if you log in as root, a # prompt is displayed. At the # prompt, type **`sci.start`** and press <Enter> to access the SCI menu.

Remote login to the AP, MRS/AP, or MRS using PPP

Supported X-terminal emulation software for remote access

Hummingbird Exceed version 5.1.3.0 for Windows 95 or Windows NT is the supported X-terminal software package for remote access to the IVR desktop graphical user interface on an AP or MRS/AP.

PPP connection

Follow these steps.

1 If a modem is not already connected to the AP or MRS/AP, then follow the steps in “Modem installation” on page 11-4.

Note: For PPP connection, a 33.6 modem or higher is required.

2 Set the terminal parameters as follows:

baud rate	38400
duplex	Full
data bits	8
stop bits	1
parity	none
add LF	off

3 From the remote location, dial in to the modem and wait for an answer. Once the modem is connected, press <Enter>.

4 At the `login:` prompt, enter the account name **nppp** and password **nppp1**.

5 A window is displayed containing unreadable information [garbage]. Close this window.

6 Connect to the server using utilities such as telnet or ftp as if the remote server were on a local LAN. Exceed can also be used at this point to create a graphical user interface connection.

Remote access to administration tools

You can access administration tools remotely using a modem. Access to administration tools is limited to one user at a time. You can also telnet over a LAN or WAN to the operating system.

The remote support capabilities are as follows:

- Access to text-based and curses-based utilities
- Dial-up link speed of 33.6 Kbps
- Point-Point protocol (PPP) connection to support running X/Motif applications remotely

Note the following restrictions:

- When you access the application remotely, Nortel recommends that you start the Application Editor in black and white mode to increase the speed. Open an xterm window on the IVR graphical user interface desktop and type **`xae -fbw`** and press <Enter>. The Application Editor starts slowly in color mode over a modem connection.
- You can run the backup utility can be run remotely, but, keep in mind, that you must physically access the AP to insert and remove media in the media drive.

Using ZMODEM communication protocol for transferring files

The file transfer between the MRS and the remote dial-up computer through ZMODEM protocol is implemented through `sz` and `rz` commands that reside at the MRS's `/usr/bin` directory.

The remote computer, which you use to dial in through a modem to the MRS, has to support ZMODEM protocol as well. When transferring files between the MRS and the remote computer, one side must run `rz` (receive file through ZMODEM) first, then the other side must run `sz` (send file through ZMODEM) to provide the file.

Most of today's Windows-based PC communication applications support ZMODEM. They can automatically respond to the remote machine and put themselves in the right send/receive mode. To transfer files between the remote computer and the MRS, follow these steps.

1. Follow the procedure in "Remote login to the SCI" on page 11-6 to dial in to the MRS, and log in as root.
2. At the `/sci` prompt, enter the `maint shell` command to get a root shell of the MRS system.
3. Use the `cd` command to get to the directory where you want to send or receive files.
4. To send files to the MRS, issue the `rz` command and then start to transfer the file using ZMODEM from remote computer.
5. For receiving files from MRS, issue the `sz` *`filename`* command to receive the `filename` file from the MRS.

   Note: The wild character `"*"` is accepted by the `sz` command.
6. In order to transfer files between AP and the remote computer, use the `ftp` command. For instructions on using `ftp`, see "ftp command" on page B-3.

To learn more about how to use the `sz` and `rz` commands, issue the command `sz` without the `filename` at the MRS's UNIX shell prompt. A list of options is displayed on the shell screen.

Chapter 12: Replacing or adding an MRS

Overview

This chapter provides high-level procedures for replacing or adding an MRS.

Note: The maximum number of MRSs on one system is four.

Replacing an MRS

Follow this procedure if an MRS is being replaced by a new MRS.

1. Perform a full backup of the existing MRS (see Chapter 15, "Backup and failure recovery"). If the MRS is disabled and you are unable to perform a full backup, then retrieve the latest backup tape.
2. Shut down and power down the existing MRS.
3. Remove the existing MRS.
4. Set up the replacement MRS as instructed in Chapter 7, "MRS/Tower installation," or Chapter 8, "MRS/Rack installation."
5. Power up the replacement MRS.
6. Restore the system image from the backup tape created in step 1.
7. Verify the functionality of the replacement MRS by performing the system verification steps as outlined in Chapter 24, "Verification test (NTTEST)."

Adding an MRS

1. Set up the new MRS as instructed in Chapter 7, "MRS/Tower installation," or Chapter 8, "MRS/Rack installation."
2. Power up the new MRS.
3. Check the IP address and host name of the new MRS, as follows:
   a. Check that a VGA terminal is connected to the MRS.
   b. Log in to the MRS as `service`.
   c. At the `/sci` prompt, type **`admin hosts list`** and press <Enter>.

      See "Hosts files" on page 13-4 for an explanation of the hosts file's contents.
4. Update the hosts and rhosts files on the other servers in the LAN, and the IP address and host name on the new MRS if necessary. See "Changing the LAN IP address or host name" on page 13-9.
5. Update the System Configuration on the AP to include another MRS. Refer to the *Symposium OPEN IVR System Administration Guide* for instructions on changing the System Configuration.
6. Within the System Configuration menu on the AP, enter the new MRS node information and also the configuration of the new trunks.

7 Use the Prompt Loading Facility to backup the VSNs from the existing MRS to the AP, and then restore the VSNs from the AP to the new MRS. See the *Symposium OPEN IVR System Administration Guide* for instructions.

8 Synch the VSNs using the `vsn` tool. See the *Symposium OPEN IVR System Administration Guide* for instructions.

9 Use `ftp` to copy trunk files from the `/usr/vrs/types` directory on the existing MRS to the new MRS, as follows:

a Log in to the new MRS as `root`.

b Use `ftp` to log in to the existing MRS (for instructions on using `ftp`, see "ftp command" on page B-3).

c Use the `mget` command, as follows:

```
ftp> mget /usr/vrs/types/* /usr/vrs/types
```

d When prompted, type **y** and press <Enter> to confirm the transfer of each file.

e At the `ftp>` prompt, type **`quit`** and press <Enter>.

10 Reset OPEN IVR from the Control Panel on the AP for the configuration changes to become effective.

11 Verify the functionality of the new MRS by performing the system verification steps as outlined in Chapter 24, "Verification test (NTTEST)." Be aware that when the test application is assigned to the channels, the trunks on the second MRS will be numbered sequentially from where the last active trunk ended on the first MRS (that is, if the first MRS had only 0–11 active trunks, the trunks on the second MRS would be numbered 12–23).

12 Perform a full system image backup of the new MRS to be stored by the distributor. See "Creating a system image backup" on page 15-4. The original system image backup tape that is shipped with the system should be stored on site in a safe place.

Chapter 13: Host name and IP address change

Overview

This chapter describes the hosts and rhosts files (which name the other servers in the network), default network configuration, and how to change the IP address and host name of an AP, MRS/AP, or MRS. The topics are grouped into the following sections:

- "Default network configuration" on page 13-2
- "Changing the LAN IP address or host name" on page 13-9

Default network configuration

Default network configuration

Default network configuration

The Symposium OPEN IVR systems have these default network configurations:

Table 13-1: AP SCO TCP/IP Configuration

Option	Value
Local Host Name	nt_ap1
IP Address	10.10.1.10
Netmask	255.255.255.0
Broadcast Address	10.10.1.255
Domain Name	nt.com
TCP Connections	1024
Pseudo TTYs	64

Note: If a redundant AP is present, the redundant AP has a host name of nt_ap2 with an IP address off 10.10.1.15.

Table 13-2: MRS/AP SCO TCP/IP Configuration

Option	Value
Local Host Name	nt_mrsap
IP Address	10.10.1.20
Netmask	255.255.255.0
Broadcast Address	10.10.1.255
Domain Name	nt.com
TCP Connections	1024
Pseudo TTYs	64

Table 13-3: MRS SCO TCP/IP Configuration

Option	Value
Local Host Name	nt_mrs1[a]
IP Address	10.10.1.1
Netmask	255.255.255.0
Broadcast Address	10.10.1.255
Domain Name	nt.com
TCP Connections	1024
Pseudo TTYs	64

a. This value is for the first MRS. Subsequent MRSs will be named nt_mrs2, nt_mrs3 and nt_mrs4. Their respective IP Addresses will be 10.10.1.2, 10.10.1.3 and 10.10.1.4.

PPP remote access

Default IP address is 128.0.0.10. The following line appears by default in the hosts file on each IVR server to allow PPP connection for remote support:

```
128.0.0.10      soivr-ppp
```

TCP/IP Host Communications

Default IP address: 10.10.2.1

IPML Ethernet Card

Default IP address: 10.10.3.1

Changing the network configuration

The section “Changing the LAN IP address or host name” on page 13-9 describes how to modify IP addresses and host names. If necessary, you can also change the netmask, broadcast address, and domain name.

To reconfigure a LAN card (change device number, etc.), you must replace the LAN card in netconfig as in “Replacing a LAN card” on page 17-14.

Hosts files

Overview

A hosts file resides on each AP, MRS/AP, or MRS in the LAN and contains the IP address and host name of the local machine and each IVR server in the LAN.

A hosts file must contain an entry for each server in the LAN to enable that server to communicate with the other servers in the LAN.

Viewing the hosts file on an AP or MRS/AP

To view the hosts file on an AP or MRS/AP, follow these steps:

1. Log in to the AP or MRS/AP as `nortel`.
2. Open an xterm window.
3. At the prompt, type **`cat /etc/hosts`**.

Viewing the hosts file on an MRS

To view the hosts file on an MRS, follow these steps:

1. Log in to the MRS as `root`.
2. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
3. At the # prompt, type **`cat /etc/hosts`**.

Aliases required for some installation and maintenance procedures

At the end of the lines that identify the IVR servers (including the local server), add the required alias for each server, as indicated in Table 13-4. For instructions on updating hosts files, see “Changing the LAN IP address or host name” on page 13-9.

Table 13-4: Required aliases for installation procedures

IVR server referenced in the hosts file	Required alias
First AP	nt_ap1
Second AP (if installed)	nt_ap2
First MRS	nt_mrs1
Second MRS	nt_mrs2
Third MRS	nt_mrs3
Fourth MRS	nt_mrs4
MRS/AP	nt_mrsap

The required alias is used by some installation and maintenance scripts. Ensure that you always include the above required aliases in the hosts files.

> ***Note:*** The required aliases are used as the default host names on new systems. If the default host names are used, then the required aliases do not need to be added to the hosts files.

A default hosts file on an AP would appear as follows:

```
127.0.0.1       localhost
128.0.0.10      soivr-ppp
10.10.1.10      nt_ap1  nt_ap1.nt.com
10.10.1.1       nt_mrs1  nt_mrs1.nt.com
```

If the default host names are adjusted (for example, to comply with customer requirements), then the required aliases need to be added to the modified hosts files. See “Hosts file examples” on page 13-6 for examples.

Hosts file examples

Below are examples of hosts files.

Sample AP or MRS/AP hosts file

```
127.0.0.1       localhost
128.0.0.10      soivr-ppp
10.10.1.10      nortel_ap  nortel_ap.nt.com  nt_ap1
10.10.1.1       nortel_mrs  nortel_mrs.nt.com  nt_mrs1
```

- Line 1 is the localhost line and appears in the hosts file of an AP, MRS/AP, or MRS as shown above.
- Line 2 contains the default IP address and host name for PPP remote access (see “Remote login to the AP, MRS/AP, or MRS using PPP” on page 11-7 for details on PPP remote access).
- Line 3 contains the information for the local host:
  - IP address (10.10.1.10)
  - host name (nortel_ap in this example)
  - alias (nortel_ap.nt.com); the alias is derived from the host name and domain name defined in the network configuration
  - alias required for some IVR installation and maintenance procedures

  Note: If there is a second LAN card (for example, to support IPML), then there will be a second line for the IP address, host name, and alias for the second LAN card.
- Line 4 and all lines that follow contain the IP address, host name, and alias for the other servers in the LAN. In this example, the MRS is listed:
  - IP address (10.10.1.1)
  - host name (nortel_mrs)
  - alias (nortel_mrs.nt.com)
  - alias required for some IVR installation and maintenance procedures

Sample MRS/Tower or MRS/Rack hosts file

```
127.0.0.1       localhost
128.0.0.10      soivr-ppp
10.10.1.1       nortel_mrs  nortel_mrs.nt.com  nt_mrs1
10.10.1.10      nortel_ap  nortel_ap.nt.com  nt_ap1
```

- Line 1 is the localhost line and appears in the hosts file of an AP, MRS/AP, or MRS as shown above.
- Line 2 contains the default IP address and host name for PPP remote access (see “Remote login to the AP, MRS/AP, or MRS using PPP” on page 11-7 for details on PPP remote access).
- Line 3 contains the information for the local server:
  - IP address (10.10.1.1)
  - host name (nortel_mrs in this example)
  - alias (nortel_mrs.nt.com); the alias is derived from the host name and domain name defined in the network configuration
  - alias required for some IVR installation and maintenance procedures
- Line 4 and all lines that follow contain the IP address, host name, and alias for the other servers in the LAN. In this example, the AP is listed:
  - IP address (10.10.1.10)
  - host name (nortel_ap)
  - alias (nortel_ap.nt.com)
  - alias required for some IVR installation and maintenance procedures

rhosts files

Overview

An rhosts file resides on each AP, MRS/AP, or MRS in the LAN and contains the host name of the local machine and each IVR server in the LAN.

The rhosts file must contain the host name of all IVR servers in the LAN in order for options installations over the LAN to execute properly (i.e., options installed on an MRS from a CD-ROM in the AP).

Viewing the rhosts file on an AP or MRS/AP

To view the rhosts file on an AP or MRS/AP, follow these steps:

1. Log in to the AP or MRS/AP as `nortel`.
2. Open an xterm window.
3. At the prompt, type **`cat ./rhosts`**.

Viewing the rhosts file on an MRS

To view the rhosts file on an AP or MRS/AP, follow these steps:

1. Log in to the MRS as `root`.
2. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
3. At the # prompt, type **`cat ./rhosts`**.

Changing the LAN IP address or host name

Overview

You may need to change the LAN IP address or name of a server for one of the following reasons:

- You are installing a new system and need to change the IP address or host names of the AP, MRS, or MRS/AP to comply with the customer's LAN.
- You are adding an AP, MRS or MRS/AP and you need to change the IP address or host name of that server to comply with the customer's LAN.

Guidelines for updating IP address and host names

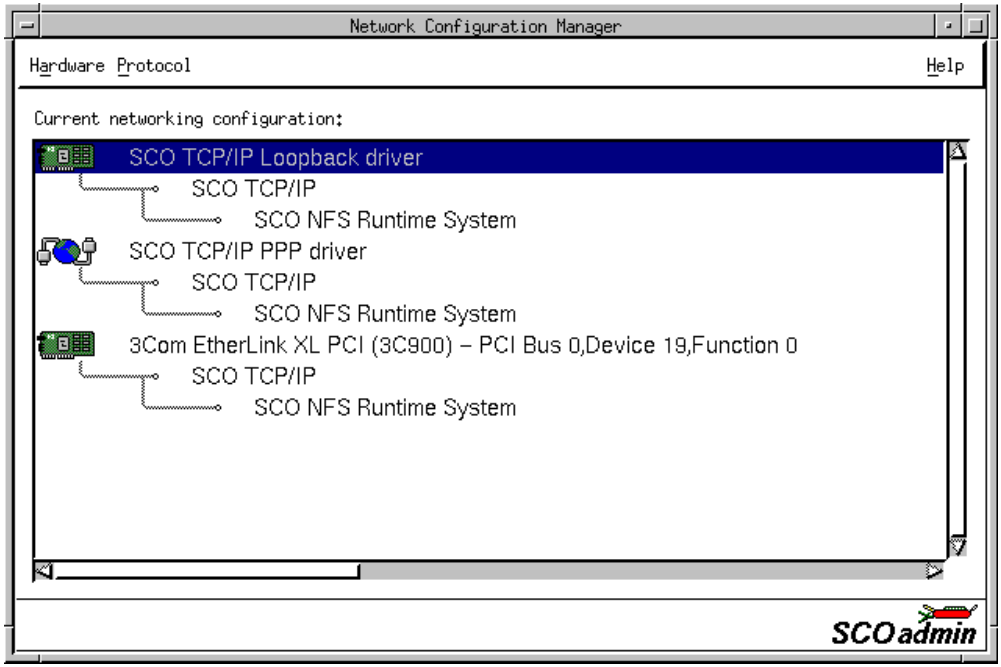
Follow these guidelines when updating IP addresses and host names:

- If you are planning to telnet to an MRS in order to update the MRS IP address or host name, then update the MRS IP address or host name first and then update the AP hosts file. If you update the AP hosts file before updating the MRS, you will not be able to telnet to the MRS.
- Ensure that the hosts files on all IVR servers in the LAN contain host information for each IVR server in the LAN. This will allow proper communication between the servers.
- Ensure that the rhosts files on all IVR servers in the LAN contain the host name for each IVR server in the LAN. This is required for feature or option installations to execute properly.
- After making changes to the hosts files or network configuration (IP address or host name change), verify the communication link between IVR servers. See Chapter 23, "Troubleshooting," for information on verifying the LAN connection.

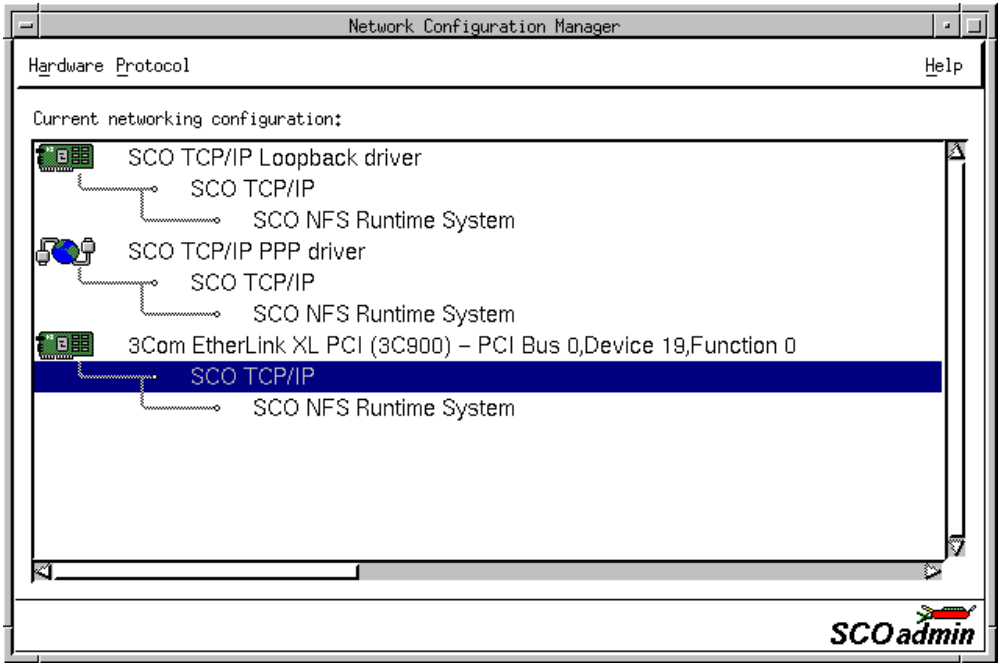
Modifying the host name and IP address

1. Log in as `root` on the AP, MRS/AP, or MRS that you are updating.
2. Do one of the following steps:
   - **a** On an AP or MRS/AP, at the # prompt, type **`netconfig`** and press <Enter>.
   - **b** On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>. At the # prompt, type **`netconfig`** and press <Enter>.

The Network Configuration Manager screen appears. The appearance and style of the screen will vary depending on your terminal type, and whether you access netconfig from the command line interface, or from a Shell window on the IVR desktop. The function of the program remains the same.

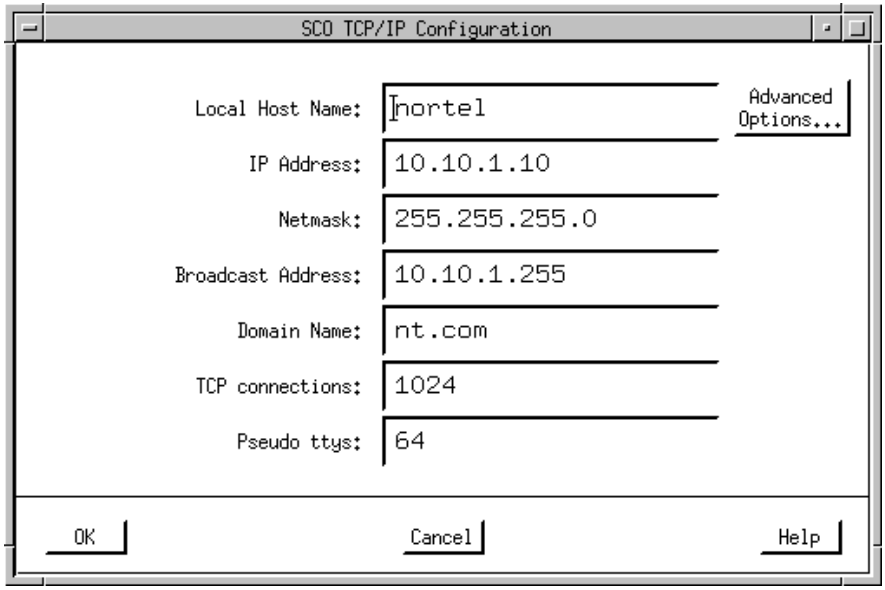


3 Select the SCO TCP/IP line from the LAN card description, as shown in the following example:



4 From the Protocol menu, select Modify protocol.

The following screen is displayed:



5 Modify the local host name and IP address as required.

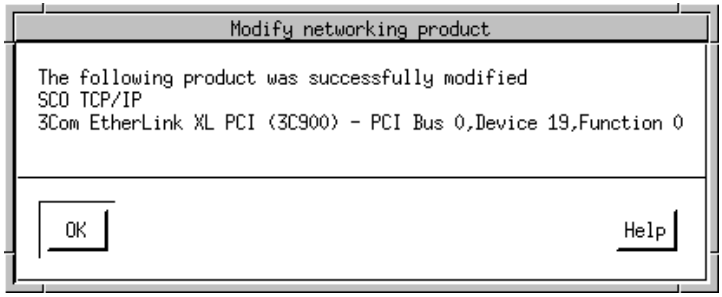
Default Netmask and Broadcast Address information is generated when you move the cursor to those lines. Modify these values if necessary.

Note 1: Do not modify the TCP connections and Pseudo ttys values.

Note 2: If you do not want to save any modifications you have made, select Cancel.

6 When you have finished modifying the TCP/IP screen, select OK.

The following confirmation message is displayed:

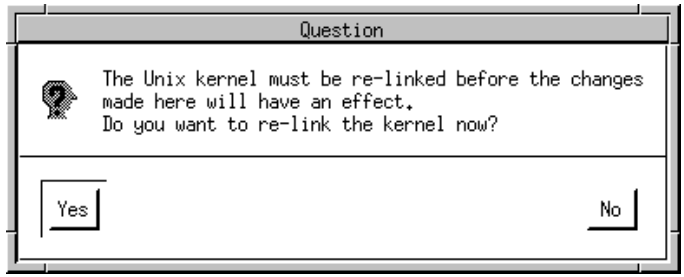

Modify networking product
The following product was successfully modified
SCO TCP/IP
3Com EtherLink XL PCI (3C900) - PCI Bus 0,Device 19,Function 0
OK
Help

7 Select OK to confirm.

The main Network Configuration Manager screen is displayed.

8 If you are finished using the Network Configuration Manager, select Exit from the Hardware menu.

The following screen is displayed:


Question
The Unix kernel must be re-linked before the changes made here will have an effect.
Do you want to re-link the kernel now?
Yes
No

9 Select Yes to relink the kernel.

After the kernel is rebuilt, the following prompt is displayed:

```
Do you want this kernel to boot by default? (y/n)
```

10 Type **y** and press <Enter>.

The following prompt is displayed:

```
Do you want the kernel environment rebuilt? (y/n)
```

11 Type **y** and press <Enter>.

The kernel is relinked, and the following is displayed:

```
The kernel has been successfully linked and
```

```
installed.
To activate it, reboot your system.

Setting up new kernel environment
Press Enter to continue
```

12 Press <Enter> to continue.

13 A host name change on the netconfig screens does not take effect after reboot. To change the host name, enter the following command before rebooting (this command is entered at the root prompt):

uname -S *newname*

14 Ensure that the hosts and rhosts files are updated on all IVR servers in the LAN to reflect any change to the IP address or host name. See “Updating the hosts and rhosts files on an MRS” on page 13-15, and “Updating the hosts and rhosts files on an AP or MRS/AP” on page 13-16.

15 Restart the system for the changes to take effect, using one of the following two commands:

a On an AP or MRS/AP, type **shutdown -y -g0** and press <Enter>. (See “Shutting down the AP or MRS/AP” on page 2-7 for more information on shutting down.)

or

b On an MRS, use the **/sci/maint/restart** option.

Updating the hosts and rhosts files on an MRS

Use this procedure when the IP address or host name has changed on another MRS or AP, when a new MRS is being added to the network, or when the MRS needs to communicate with another server on the LAN.

1. Log in to the MRS as the `root`.
2. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
3. Make a backup copy of the `/etc/hosts` file. At the prompt, type **`cp /etc/hosts etc/hosts.bak`** and press <Enter>.
4. Edit the file `/etc/hosts` using the `vi` editor. At the prompt, type **`vi /etc/hosts`** and press <Enter>.
5. Update the hosts file to reflect changes in IP address or host name, or additional IVR servers in the LAN.
6. Ensure that the required "nt" alias is at the end of each line that identifies an IVR server (see “Aliases required for some installation and maintenance procedures” on page 13-5).
7. Save the changes and exit the editor.

   Note: If a host name has changed, or a server has been added to the IVR LAN, then you must also update the rhosts file, as described in the following steps. If only the IP address information has changed, then you do not need to update the rhosts file.

8. Make a backup copy of the `./rhosts` file. At the prompt, type **`cp ./rhosts ./rhosts.bak`** and press <Enter>.
9. Edit the file `./rhosts` using the `vi` editor. At the prompt, type **`vi ./rhosts`** and press <Enter>.
10. Update the rhosts file to reflect changes to host names. If an IVR server has been added to the LAN, add the host name for the new server.
11. Save the changes and exit the editor.
12. Exit from the UNIX shell.

Updating the hosts and rhosts files on an AP or MRS/AP

Use this procedure when the IP address has changed on an MRS, or when a new MRS is being added to the network, or when the AP needs to communicate with another server on the LAN. This procedure can also be used to update the hosts and rhosts files on an MRS/AP.

1 Log in to the AP or MRS/AP as `nortel`.

2 Open an xterm window and click inside it.

3 Type the **su** command and press <Enter>.

4 Enter the root password at the password prompt.

5 Make a backup copy of the `/etc/hosts` file. At the prompt, type **`cp /etc/hosts etc/hosts.bak`** and press <Enter>.

6 Edit the file `/etc/hosts` with an editor.

Use `vi` with this command:
`vi /etc/hosts`
or
Use `nedit` with this command:
`/u/nortel/tools/nedit /etc/hosts`
or
Use `scoedit` with this command:
`/usr/bin/X11/scoedit /etc/hosts`

7 Update the hosts file to reflect changes in IP address or host name, or additional IVR servers in the LAN.

8 Ensure that the required "nt" alias is at the end of each line that identifies an IVR server (see “Aliases required for some installation and maintenance procedures” on page 13-5).

9 Save the changes and exit the editor.

Note: If a host name has changed, or a server has been added to the IVR LAN, then you must also update the rhosts file, as described in the following steps. If only the IP address information has changed, then you do not need to update the rhosts file.

10 Make a backup copy of the `./rhosts` file. At the prompt, type **`cp ./rhosts ./rhosts.bak`** and press <Enter>.

11 Edit the file `./rhosts` with an editor.

Use `vi` with this command:
`vi ./rhosts`
or
Use `nedit` with this command:
`/u/nortel/tools/nedit ./rhosts`
or
Use `scoedit` with this command:
`/usr/bin/X11/scoedit ./rhosts`

12 Update the rhosts file to reflect changes to host names. If an IVR server has been added to the LAN, add the host name for the new server.

13 Save the changes and exit the editor.

Chapter 14: Upgrade procedures

Introduction

This chapter describes the procedures for

- upgrading your OPEN IVR 2.x software to Symposium OPEN IVR release 4.0
- upgrading your current OPEN IVR 2.x applications to the new release level
- upgrading from a runtime system to a development system (see "Upgrading from a runtime system to a development system" on page 14-41)

  Note: When setting up a distributed system, the AP must be set up before the MRS.

Replacing or installing Release 2.x hardware components

A hardware upgrade from PEB to SCbus is not supported. This chapter discusses a software upgrade to Symposium OPEN IVR 4.0.

For future hardware installation or maintenance requirements, you will need to refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*, except where specific instructions are provided in this manual. Please retain your Nortel IVR 2.0/S documentation.

To install options on your Release 2.x hardware, refer to the appropriate Symposium OPEN IVR 4.0 option guides.

MRS/AP with TTS, UPS, and Madge Token Ring card

Customers who have the combination of TTS, UPS and Madge Token Ring card on an MRS/AP cannot use the procedures in this chapter to upgrade from OPEN IVR 2.x to Symposium OPEN IVR 4.0. Call Nortel customer support for guidance.

Before you begin

This section outlines the things you should do to prepare for the upgrade of your system's software. An upgrade roadmap is provided to aid in planning the work items required before, during, and after the upgrade process.

Upgrade roadmap

The upgrade roadmap is provided to help you plan, install, and complete the Symposium OPEN IVR 4.0 software upgrade successfully.

The roadmap contains

- work items to be completed before starting the upgrade
- the procedures required to install the upgrade software
- the final steps required to complete the upgrade process

Table 14-1: Symposium OPEN IVR 4.0 upgrade roadmap

What to do		How to do it	✔
1	Ensure that you are not upgrading an MRS/AP which has TTS, UPS, and a Madge Token Ring card.	See "MRS/AP with TTS, UPS, and Madge Token Ring card" on page 14-2	
2	Ensure that you have received all required components for the upgrade and that it is on hand.	See "Symposium OPEN IVR 4.0 upgrade package" on page 14-3.	
3	If application prompts are in the range 0-6499, move them to another range.	See "Moving application prompts out of the system prompt range" on page 14-5.	
4	Create backups of your system(s). Before you begin any changes or upgrades to your system, you must always create a backup of your current system.	See "Creating a complete system backup" on page 14-6.	

What to do		How to do it	✔
5	Back up items that you will need to restore on the upgraded system.	See “Backing up customized files to restore on upgraded system” on page 14-12.	
6	Record existing hosts file and network configuration information.	See “Recording existing hosts file and network configuration information” on page 14-13.	
7	Check the `usr_main.c` file.	See “Upgrading User Functions” on page 14-13.	
8	Upgrade your system.	See “Upgrading your system to Symposium OPEN IVR 4.0” on page 14-14.	
9	Restore customized files.	See “Restoring customized files” on page 14-32.	
10	Restore Release 4.0 system prompts.	See “Restoring Release 4.0 system prompts” on page 14-34.	
11	Update your applications from previous releases of OPEN IVR.	See “Upgrading applications from IVR 2.x” on page 14-35.	
12	Complete the upgrade process.	See “Final steps in the upgrade process” on page 14-40.	

Symposium OPEN IVR 4.0 upgrade package

The Symposium OPEN IVR 4.0 upgrade package to update from OPEN IVR 2.x contains the items listed in Table 14-2. Before beginning the upgrade, check to ensure that you have received the required items.

Note: Depending on the purchase order, there may be additional components in the upgrade package.

Table 14-2: Symposium OPEN IVR 4.0 upgrade package

Components	Media / Quantity
BASE MRS	
Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1	CD-ROM / 1
OPEN IVR 4.0 MIT Boot Diskette 1/1- R2 MRS, SMC Ethernet, CD Installation/Tape Recovery	3.5 inch diskette / 1
OPEN IVR 4.0 MIT Boot Diskette 1/1 - R2 MRS, Madge Token Ring, CD Installation/Tape Recovery	3.5 inch diskette / 1
OPEN IVR 4.0 MIT Root Diskette 1/1 - R2 MRS, CD Installation/Tape Recovery	3.5 inch diskette / 1
Emergency Root Diskette 1/1 - R2 MRS	3.5 inch diskette / 1
Emergency Boot Diskette 1/1 - R2 MRS	3.5 inch diskette / 1
BASE AP, MRS/AP	
Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1	CD-ROM / 1
OPEN IVR 4.0 MIT Boot Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS Local, CD Installation/Tape Recovery	3.5 inch diskette / 1
OPEN IVR 4.0 MIT Root Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS, CD Installation/Tape Recovery	3.5 inch diskette / 1
Emergency Boot Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS	3.5 inch diskette / 1
Emergency Root Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS	3.5 inch diskette / 1
OPEN IVR 4.0 License File Diskette	3.5 inch diskette / 1
32 Mbyte RAM to bring machine to 64 Mbyte	16Mbyte DRAM SIMMs with parity / 2
4.5 Gbyte hard disk	1

Components	Media / Quantity
CD-ROM drive for an AP or MRS/AP	1
U.S. Robotics 33.6 modem (optional - not required for all regions)	1
Other	
OPEN IVR 4.0 Release Supplement CD	CD-ROM / 1
OPEN IVR 4.0 UPS Software	CD-ROM / 1
Replacement Antares security keylock, if L&H Text-to-Speech is installed	
License Manager security keylock(s) - labeled for each server	

Moving application prompts out of the system prompt range

If application prompts are in the range reserved for system prompts in Symposium OPEN IVR 4.0, then they must be moved prior to backing up VSNs prior to the upgrade.

1 Check if application VSNs are in the system prompt range for Symposium OPEN IVR 4.0 (0 - 6499).

2 Use the `mvpmt` tool to move prompts if necessary.

To invoke the `mvpmt` tool, type

`mvpmt <prompt range> <offset>`

where

`<prompt range>` is the existing prompt numbers of the first and last prompt to be moved, separated by a “-” (hyphen).

`<offset>` is the difference between the existing prompt number and the new prompt number of the first prompt in the prompt range.

For example, to move the prompts 6100-6150 to the new location 7300-7350, the command is `mvpmt 6100-6150 1200`.

Creating a complete system backup

Before beginning any upgrade to your system, you must back up your system. The backups are created by using backup scripts. Customers running OPEN IVR 2.5 should already have these backup scripts installed on their systems.

Customers running OPEN IVR 2.0 should install these backup scripts from the software diskettes provided. See "Installing backup scripts" below for information on installing the backup scripts.

Note 1: A blank 2.5 Gbyte tape is required for each back up.

Note 2: Do not back up more data than the capacity of the backup tape.

Installing backup scripts

If you are running OPEN IVR 2.0, install the following scripts and use them to back up your system.

Note: Customers running OPEN IVR 2.5 should already have these scripts installed.

Installing the AP and MRS/AP HD Backup script

To install the AP and MRS/AP HD Backup script, follow these steps.

1. Insert the diskette labeled "AP & MRS/AP HD Backup Script" into the floppy drive of the AP or MRS/AP.
2. Log in to the AP or MRS/AP as `root`.
3. At the prompt on an AP, type **`tar -x`** and press <Enter>. On an MRS/AP, type **`tar -xv6`** and press <Enter>.

   The script is installed.
4. Remove the diskette from the floppy drive.

Installing the MRS and VSN Backup scripts

To install the MRS and VSN backup scripts, follow these steps.

1. Log in to the MRS as `root`.
2. At the `sci/install` prompt, type **`restore`** and press <Enter>.
3. Insert the diskette labeled "MRS Version 2.5 MRS HD & VSN Backup Scripts" into the floppy drive and press <Enter>.

4 When the extract is complete, remove the diskette from the floppy drive and continue with the next upgrade.

Running backup scripts

Backup of the AP or MRS/AP

To run the backup script, follow these steps.

1 Press the <ALT>, <CNTRL>, and <F1> keys to access the command-line screen.

2 Log in to the AP or MRS/AP as `root`.

3 Insert a blank 2.5 Gbyte tape into the tape drive.

4 To invoke `backmeup`, type **`backmeup`** at the prompt and press <Enter>.

The system displays the following prompt:

```
This will copy the UNIX and DOS partition onto tape.
Continue? (y/n)
```

5 At the prompt, type **y** and press <Enter>.

The system displays the following prompt:

```
Do you want to copy the DOS partition into the UNIX root
filesystem? (y/n)
```

6 At the prompt, type **y** and press <Enter>.

The system displays the following message:

```
This will take a few minutes.
```

This step will take about 10 minutes. Once the partitions are backed up, the system displays the following message:

```
Please make sure a Tape is inserted in the Tape Drive,
Continue? (y/n)
```

7 Type **y** and press <Enter>.

The system displays the following messages:

```
SYSTEM IMAGE WILL BE BACKED UP TO TAPE

BACKUP IN PROGRESS PLEASE WAIT......
```

This will take approximately 30 to 45 minutes.

8 When the backup is complete, remove the tape from the drive, label it, and store it in a safe place.

9 Go to "VSN files backup on the MRS/AP" below to back up the VSN files.

VSN files backup on the MRS/AP

VSN files must be backed up separately as these are not backed up by the `backmeup` script.

To back up VSN files, follow these steps.

1 Log in to the MRS/AP as `root`.

2 Insert a blank backup 2.5 Gbyte tape into the tape drive.

3 At the prompt, type **`backup.vsn`** and press <Enter>.

The system displays the following message:

```
Is your tape drive located on the same machine as the data?
[ynq]
```

Note: If the backup program does not detect VSN storage, the system asks if you want to do a `mountall`.

4 Type **y** and press <Enter>.

The system displays the following messages:

```
This utility can only back up to a single tape volume, so
please use a sufficient tape size.

Please enter the tape size in megabytes (MB) [2500]:
```

5 To take the default tape size, press <Enter>**.**

The system displays the following message:

```
Do you wish to back up all volumes? (xMB) [ynq]
```

where `xMB` is the size in Mbyte detected.

6 Type **y** and press <Enter>.

The system displays the following message:

```
Proceeding with the backup of /vrs.

Is the tape in the drive? [ynq]
```

7 Type **y** and press <Enter>.

All files that are backed up are displayed on the screen. When the backup is complete, the system displays the following message:

```
Done VSN backup.
```

8 Remove the tape from the drive. Label the tape and store it in a safe place.

Backup of the MRS

Verifying the `/.rhosts` file

Before conducting a full MRS system backup, make sure that the host name of the MRS system to be backed up is in the `/.rhosts` file. If your system does not have a /.rhosts file, use the following procedure to create, edit, and set up the file. To verify the `/.rhosts` file, follow these steps.

1 Log in to the AP as `root`.

2 Create this file in the root directory (/) if it does not exist.

3 Edit the `/.rhosts` file (use vi or another editor) to add the MRS host name to the file.

4 After editing the `/.rhosts` file, type
`chmod 644 /.rhosts;chown root /.rhosts`
at the root prompt and press <Enter>.

This command sets the correct ownership and permissions.

To continue with the backup of the MRS, follow these steps.

1 Log in to the MRS as `root`.

2 At the `/sci` prompt, type **`maint shell`** and press <Enter>.

3 Insert a blank 2.5 Gbyte tape into the tape drive.

4 At the # prompt, type **`backmeup`** and press <Enter>.

5 When prompted, type the AP's node name and press <Enter> (or type **`q`** and press <Enter> to abort the backup).

The system displays the following prompt:

```
Please make sure a tape is inserted in the AP's Tape drive,
Continue (y/n)
```

6 Make sure that the tape is in the AP drive. Then type **y** and press <Enter>.

The system displays the following message:

```
Backup in progress, please wait.
```

When the backup is complete, the system displays the following message:

```
End of backup. Please label your tape and put it in a safe
location.
```

VSN files must be backed up separately as these are not captured by `backmeup`. The VSN backup procedure is described in "Backup of VSNs on MRS" on page 14-10.

Backup of VSNs on MRS

Prior to backup of VSNs on the MRS, the MRS and VSN Backup Scripts must be installed. See "Installing the MRS and VSN Backup scripts" on page 14-6 for more information.

ATTENTION

Perform this procedure when traffic is low or when the system is offline. The procedure's use of network resources may reduce the responsiveness of the system.

To back up the VSNs on the MRS, follow these steps.

1 Log in to the MRS as `root`.

2 At the `/sci` prompt, type **`maint shell`** and press <Enter>.

3 Insert a blank backup 2.5 Gbyte tape into the tape drive on the AP.

4 At the prompt, type **`backup.vsn`** and press <Enter>.

The system displays the following message:

```
Is your tape drive located on the same machine as the data?
[ynq]
```

Note: If the backup program does not detect VSN storage, the system asks if you want to do a `mountall`.

5 Type **n** and press <Enter>.

The system displays the following message:

```
Please enter the tape host [nortel]:
```

Note: The tape host is the AP.

6 Enter the tape host name and press <Enter> (or press <Enter> to accept the default).

The system displays the following messages:

```
This utility can only back up to a single tape volume, so
please use a sufficient tape size.

Please enter the tape size in Mbytes (MB) [2500]:
```

7 To take the default tape size, press <Enter>**.** To specify a different tape size, type in the size (in Mbyte) and press <Enter>.

The system displays the following message:

```
Do you wish to back up all volumes? (xMB) [ynq]
```

where xMB is the size in Mbyte detected.

8 Type **y** and press <Enter>.

The system displays the following message:

```
Proceeding with the backup of /vrs.

Is the tape in the drive? [ynq]
```

9 Type **y** and press <Enter>.

All files that are backed up are displayed on the screen. When the backup is complete, the system displays the following message:

```
Done VSN backup.
```

10 Remove the tape from the drive. Label the tape and store it in a safe place.

Backing up customized files to restore on upgraded system

Backup the following files using the backup tool (refer to the Release 4.0 *Symposium OPEN IVR System Administration Guide* for backup tool instructions).

On an AP

- OPEN IVR applications (`/u/nortel/apps`)
- user function source code (`/u/nortel/exe`)
- customized local IVR databases (`/u/nortel/sys_files`)

  Note: Ensure that you also backup VSNs, as instructed in this chapter, in order that the message contents of the databases are backed up.

- SQL database if installed on the AP
- host interface templates (`/u/nortel/3270 or 5250`, and so on)

On an MRS/AP

- VSN volumes (if you have backed up your system, including VSNs, as instructed in "Creating a complete system backup" on page 14-6, then this step has been completed)
- OPEN IVR applications (`/u/nortel/apps`)
- user function source code (`/u/nortel/exe`)
- customized local IVR databases (`/u/nortel/sys_files`)

  Note: Ensure that you also backup VSNs, as instructed in this chapter, in order that the message contents of the databases are backed up.

- SQL database if installed on the MRS/AP
- TIFF fax images (`/u/nortel/fax.d/`*xxx*), where *xxx* is the name or directory of customized fax images
- customized reports (`/u/nortel/stat.d/`x*xx*), where *xxx* is the name or directory of customized reports
- customized trunk type files (`/usr/vrs/types/`*xxx*), where *xxx* is the name or directory of customized trunk files
- host interface templates (`/u/nortel/3270 or 5250`, and so on)

On an MRS

- VSN volumes (if you have backed up your system, including VSNs, as instructed in "Creating a complete system backup" on page 14-6, then this step has been completed)
- customized trunk type files (`/usr/vrs/types/`*xxx*), where *xxx* is the name or directory of customized trunk files

Recording existing hosts file and network configuration information

For each IVR server, record existing hosts file and TCP/IP network configuration information, as follows:

1. Follow the first part of the procedure in "Replacing a LAN card" on page 17-14 until you view the SCO TCP/IP Configuration screen.
2. Write down the values on the SCO TCP/IP Configuration screen. During the upgrade, you will have to reenter this information.
3. Exit out of `netconfig`.
4. View and record hosts file information. See "Hosts files" on page 13-4.
5. Repeat steps 1 to 4 for each IVR server.

Upgrading User Functions

The file `usr_main.c` has been replaced by the library `usr.a` in Symposium OPEN IVR 4.0. If the `usr_main.c` file was customized, contact Nortel support for information to rebuild the user function properly for this release.

Note: Confirm whether `usr_main.c` has been customized before you upgrade the system.

Checking if usr_main.c has been customized

If you are not sure if the `usr_main.c` file was customized, do a checksum of the file. To do a checksum, issue the following command at the UNIX prompt in the directory containing the `usr_main.c` file:

```
sum usr_main.c
```

An OPEN IVR 2.01 `usr_main.c` file should have a checksum of 39888, 66 blocks.

An OPEN IVR 2.5 `usr_main.c` file should have a checksum of 39752, 66 blocks.

If your `usr_main.c` file does not have the correct checksum value for your current release, then contact Nortel support.

Upgrading your system to Symposium OPEN IVR 4.0

The Symposium OPEN IVR 4.0 upgrade is contained on a boot CD and a boot diskette. For more information on the upgrade package, see “Symposium OPEN IVR 4.0 upgrade package” on page 14-3. The installation is run first on the AP and then on the MRS for an unfolded system. For an MRS/AP, there is a separate upgrade procedure.

ATTENTION

Ensure that you have created a backup of your OPEN IVR 2.x system before proceeding with this upgrade. The Symposium OPEN IVR Release 4.0 upgrade overwrites the current system, including VSNs, options, and applications.

Report Writer

Report Writer and perl executables are now installed automatically. The installation script no longer prompts you to install Report Writer software. The system does not display any messages about installing Report Writer.

Upgrading the AP or MRS/AP

Ensure you have:

- backed up your system (see “Creating a complete system backup” on page 14-6)
- backed up individual items that will need to be restored after the upgrade (see “Backing up customized files to restore on upgraded system” on page 14-12)
- written down the TCP/IP network configuration values for systems to be upgraded (see “Recording existing hosts file and network configuration information” on page 14-13)

To upgrade your AP or MRS/AP to Symposium OPEN IVR 4.0, follow these steps.

Preparing for the upgrade of an AP or MRS/AP

1 Shut down the AP or MRS/AP and power it off. (See the section “Shutting down the AP or MRS/AP” on page 2-7 for more information.)

2 Detach the dongle (security keylock) on the AP or MRS/AP, and replace it with the License Manager security keylock received with the upgrade package. The security keylock is labeled to indicate the corresponding server.

3 For an MRS/AP only, if L&H Text-to-Speech is installed, also replace the TTS security keylock on the Antares card with the new L&H TTS security keylock.

4 Install the CD-ROM drive that came with the upgrade package, as follows:

a Remove the chassis cover. For instructions, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

b Remove the two screws holding the plate in the front of the unit, under the Tape Drive.

c Set the SCSI ID on the CD-ROM drive to 5.

d Disable termination.

e Insert the CD-ROM drive in the open bay under the Tape Drive.

f Attach the CD-ROM to the SCSI cable. It can be attached anywhere convenient, as long as it is not the last device.

g Reattach the chassis cover.

5 Install the 4.5 Gbyte hard disk that came with the upgrade package, as follows:

   a Remove the existing hard disk. For instructions, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

   b Disable termination on the new hard disk.

   c Set the SCSI ID on the new hard disk to 0.

   d Install the new hard disk where the old hard disk was removed.

6 Adjust hardware settings, as indicated in the following substeps:

   a If the system contains a ZNYX Ethernet card, you must change the IRQ before continuing with the upgrade. Follow the steps in “Changing ZNYX IRQ settings” on page 14-16.

   b If the system contains a SYNC/570 host card, you may need to change the IRQ and I/O address. Follow the steps in “Upgrading the SYNC/570 SDLC host connectivity card” on page 14-30.

   c If the system contains a Madge Token Ring LAN or HOST card, change the IRQ to match the value in the Release 4.0 *Symposium OPEN IVR Planning and Engineering Guide*. Instructions for configuring the Madge Token Ring card, including IRQ setting, can be found in the *Nortel IVR 2.0/S Installation and Maintenance Guide*, “Application Processor hardware” chapter.

Changing ZNYX IRQ settings

1 Ensure that the AP or MRS/AP is shut down and powered off.

2 Remove the cover and ensure that the ZNYX Ethernet card is in the top slot of the AP or MRS/AP. If it is not, then do the following:

   a Disconnect the LAN cable from the card.

   b Remove the screws that hold the card in its current slot.

   c Reinsert the card in the top slot and screw in the retaining screws.

   d Reconnect the LAN cable.

3 Reinstall the chassis cover.

4 Insert an MS-DOS 6.22 or higher version system diskette in the floppy drive.

5 Power on the system.

6 At the DOS prompt, type **c :** and press <Enter>.

7 Type **`cd c:\scu`** and press <Enter>.

8 Type **`amiscu.exe`** and press <Enter>.

9 At the WARNING notice, press <Enter> to continue.

10 Arrow down to Change Configuration Settings and press <Enter>.

11 Press <Esc> to skip password entry.

12 Should a WARNING occur, press <Esc> to skip it.

13 Arrow down to PCI Ethernet Device and press <Enter>.

14 Press <Enter> again to change.

15 Arrow down to Manual Configuration and press <Enter>.

16 Press F6 to Edit Resources.

17 Use the + key to adjust the IRQ to 11.

18 Press <Enter> when done, then press <Esc>.

19 Press <Esc> again.

20 Arrow down to Save Configuration and press <Enter>.

21 Press <Esc> to exit and press <Enter> for YES.

22 Remove the DOS bootup diskette.

Upgrading the AP or MRS/AP software

Note: If during this procedure the CD-ROM appears stuck in the drive, type **`umount /mnt`** and press <Enter>. Then remove the CD-ROM.

1 Ensure that the AP or MRS/AP is shut down and powered off.

2 Insert the *boot* diskette labeled “OPEN IVR 4.0 MIT Boot Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS Local, CD Installation/Tape Recovery” into the floppy drive.

3 Power up the system. As the system is powering up, insert the CD-ROM labeled “Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1” into the AP or MRS/AP CD-ROM drive.

4 At the `boot` prompt, press <Enter>.

5 When prompted, insert the *root* diskette labeled “OPEN IVR 4.0 MIT Root Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS, CD Installation/Tape Recovery.”

6 Press <Enter>.

The following prompt is displayed:

```
Enter client name (Press enter for local
operation):
```

7 Press <Enter>.

The following prompt is displayed:

```
Enter source media (cd or tape):
```

8 Type **cd** and press <Enter>.

The system begins to install the upgrade onto the AP or MRS/AP and takes approximately 60 minutes for the Release 4.0 data to be copied onto the system.

9 When the system has finished reading the data from the CD-ROM, remove the root diskette, but leave the CD-ROM in the drive.

10 Reboot the system by pressing <Enter>.

11 When the `boot:` prompt appears, press <Enter>.

During the bootup sequence, the following prompt appears:

```
Type Control-d to enter normal setup,
(or enter the root password for system maintenance)
```

12 Type **root1** and press <Enter>.

Note: `root1` is the default root password in Release 4.0. All existing passwords are overwritten with the default Release 4.0 passwords during this upgrade procedure. See Chapter 2, "Before you begin," for Release 4.0 default passwords.

13 Type **mountall** and press <Enter>.

14 Insert the CD-ROM labeled "OPEN IVR 4.0 Release Supplement CD" into the AP CD-ROM drive.

15 Mount the CD-ROM. Type `mount /dev/cd0 /mnt` and press <Enter>.

16 Read the `readme` file on the CD-ROM and do the following:

a Make note of any patches that need to be installed at this point or at a later time.

b Install any patches that need to be installed now.

c Continue with the next step in this procedure.

17 Unmount the CD-ROM. Type `umount /mnt` and press <Enter>.

18 Remove the "OPEN IVR 4.0 Release Supplement CD" and reinsert the "Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1."

19 Type **`ntkeylock`** to view the License Manager security keylock serial number.

20 Write down the serial number for future use.

21 Run **`netconfig`** to configure the LAN card and re-enter the TCP/IP network configuration values on the MRS/AP.

For instructions, see "Replacing a LAN card" on page 17-14.

For card configuration values (I/O address, and so on), refer to the Release 4.0 *Symposium OPEN IVR Planning and Engineering Guide*.

22 Edit the `/etc/hosts` file as follows:

a Restore the information that was there before the upgrade.

b At the end of the lines that identify the IVR servers (including the local server), add the required alias for each server, as follows:

IVR server referenced in the hosts file	Required alias
First AP	nt_ap1
Second AP (if installed)	nt_ap2
First MRS	nt_mrs1
Second MRS	nt_mrs2
Third MRS	nt_mrs3
Fourth MRS	nt_mrs4
MRS/AP	nt_mrsap

For example,
`10.10.1.10  ap_name  ap_name.nt.com  nt_ap1`

For instructions, see "Updating the hosts and rhosts files on an AP or MRS/AP" on page 13-16.

23 Ensure that the `./rhosts` file contains the host names of all the other IVR servers in the LAN. See “rhosts files” on page 13-8 and “Updating the hosts and rhosts files on an AP or MRS/AP” on page 13-16.

24 Type **`init 6`** to reboot the system.

25 When the `boot:` prompt appears, press <Enter>.

During the bootup sequence, the following prompt appears:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance):
```

26 Press Ctrl-d.

27 When the SCO Login window appears, press Ctrl-Alt-F1 to access the command-line interface.

28 Log in to the AP or MRS/AP as `root`.

29 If the Disk Mirroring option was purchased, then do the following:

a Install the Disk Mirroring software.

b Register the Disk Mirroring software.

c Install the secondary disk.

d Mirror the root disk.

e Stop the Disk Mirroring install and continue with the upgrade procedure. After the upgrade is completed, complete the Disk Mirroring installation.

Note: For instructions, see Chapter 16, “Disk Mirroring option.”

30 Insert the diskette labeled “OPEN IVR 4.0 License File Diskette” into the floppy drive on the AP or MRS/AP.

31 Type **`install_licenses`** and press <Enter>.

When all systems are updated, a success message is displayed.

32 Remove the license file diskette from the floppy drive.

33 For an AP only, do the following:

a Insert the CD-ROM labeled “Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1” into the AP CD-ROM drive.

b Go to “Upgrading the MRS” on page 14-24 and complete the MRS upgrade.

c Reinsert the “Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1” into the AP CD-ROM drive

d Continue with the next step in this procedure.

34 Type **`cd /scripts`** and press <Enter>.

35 Type **`./setup`** to run the installation script.

36 Select the system type and press <Enter>.

37 When prompted to insert the CD-ROM, press <Enter>.

Several prompts and messages are flashed on the screen. Ignore these prompts and messages. They are part of the setup script.

When the script is completed, it will automatically reboot the system.

38 When the `boot:` prompt appears, press <Enter>.

During the bootup sequence, the following prompt appears:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance):
```

39 Press Ctrl-d.

40 When the SCO Login window appears, press Ctrl-Alt-F1 to access the command-line interface.

41 Log in to the AP or MRS/AP as `root`.

42 Configure the VGA monitor using **`scoadmin`**. For instructions, refer to the SCO documentation.

43 Press Ctrl-Alt-F2 to access the SCO Login window.

44 Press restart at the scologin screen.

45 On an AP, go to step 46.

On an MRS/AP only, do the following substeps:

a Log in to the MRS/AP as `root`.

b Type **`sci.start`** and press <Enter> to access the SCI.

c Clear VSN volumes using the **`/sci/files/vsn/clear`** option.

d Use the **/sci/setup/trkbrd** option to activate the telco cards.

For D/41ESC, D/160SC-LS, and D/240SC-T1 instructions, see Chapter 19, "Telco interface card installation."

For any other telco cards, refer to the /sci/setup/trkbrd and /sci/config/trunk sections in the Release 4.0 *Symposium OPEN IVR Service Console Interface Reference Manual*.

e Perform the software installation and activation for any text-to-speech, speech recognition, or fax options you have purchased. Refer to the Symposium OPEN IVR 4.0 option guides for instructions.

f At the /sci prompt, type **maint shell** and press <Enter>.

g Type **cd /scripts** and press <Enter>.

h Type **./setup** to run the installation script.

i Type **7** to install tones and prompts, and press <Enter>.

Wait for # prompt to appear before continuing.

j If you have installed L&H Text-to-Speech, then type **cd /scripts** and press <Enter>. Then type **opt.setup** and press <Enter>.

k When the setup script has completed, exit the shell.

l Use **/sci/maint/restart** to reboot the system.

46 Log into the AP or MRS/AP as **nortel** with password **nortel1**.

47 From the Symposium OPEN IVR Control Panel, select Administration tools, then System Configuration.

48 From the System Configuration Node Menu, press <F2> to go to trunks.

49 Set all lines as ring trip. Use <F3> to go to the next trunk to configure.

50 When complete, press <F4> to return to the System Configuration Node Menu.

51 For an AP only, set the node names of the MRSs.

52 Set the maximum number of system-wide prompts to 20000.

53 Set the maximum number of local prompts to 20000.

54 Press <F4> to exit the menu. When prompted, save the changes. Select Yes and press <Enter>.

55 In an Xterm window, type **`admingen stop;admingen start`** and press <Enter>.

56 Use the Prompt Loading Facility to load NTTEST prompts 400-499.

57 Load and run the NTTEST application on all channels. For instructions, see Chapter 24, "Verification test (NTTEST)."

58 Restore customized 2.x items. See "Restoring customized files" on page 14-32.

59 Restore Release 4.0 system prompts. See "Restoring Release 4.0 system prompts" on page 14-34.

60 Upgrade applications. See "Upgrading applications from IVR 2.x" on page 14-35.

61 Go to "Final steps in the upgrade process" on page 14-40.

Upgrading the MRS

Ensure you have:

- backed up your system (see “Creating a complete system backup” on page 14-6)
- backed up individual items that will need to be restored after the upgrade (see “Backing up customized files to restore on upgraded system” on page 14-12)
- written down the TCP/IP network configuration values for systems to be upgraded (see “Recording existing hosts file and network configuration information” on page 14-13)

To upgrade your MRS to Symposium OPEN IVR 4.0, follow these steps.

1 Shut down the MRS and power it off. (See “Shutting down the MRS” on page 2-8 for more information.)

2 If a new Serial I/O card was included in the upgrade package, install it now. See “Replacing the Serial I/O card” on page 14-31.

3 Install the License Manager security keylock that was received with the upgrade package. The License Manager security keylock must be attached to the parallel port on the Serial I/O card. The security keylock is labeled to indicate the corresponding server.

4 If L&H Text-to-Speech is installed, also replace the TTS security keylock on the Antares card with the new L&H TTS security keylock.

5 Insert one of the following diskettes (based on your network type) into the floppy drive on the MRS:

- OPEN IVR 4.0 MIT Boot Diskette 1/1- R2 MRS, SMC Ethernet, CD Installation/Tape Recovery
- OPEN IVR 4.0 MIT Boot Diskette 1/1 - R2 MRS, Madge Token Ring, CD Installation/Tape Recovery

6 Power up the system.

7 At the `boot` prompt, press <Enter>.

8 When prompted, insert the *root* diskette labeled “OPEN IVR 4.0 MIT Root Diskette 1/1 - R2 MRS, CD Installation/Tape Recovery” into the floppy drive on the MRS

9 Press <Enter>.

The following prompt is displayed:

```
 Enter client name (Press enter for local
operation):
```

10 Type the MRS host name and press <Enter>.

The following prompt is displayed:

```
Enter source media (cd or tape):
```

11 Type **cd** and press <Enter>.

12 Answer the following prompts:

```
 Enter client IP address:
 Enter server IP address:
 Enter client netmask:
```

Note: The client is the MRS and the server is the AP.

13 You are prompted to confirm your responses to the prompts in step 12. Type **y** and press <Enter>.

The system begins to install the upgrade onto the MRS and takes approximately 60 minutes for the Release 4.0 data to be copied onto the system.

14 When the installation of the information is complete, remove the root diskette from the floppy drive. Leave the CD-ROM in the drive.

15 At the prompt, press <Enter> to reboot the system.

16 When the `boot:` prompt appears, press <Enter>.

During the bootup sequence, the following prompt appears:

```
Type Control-d to enter normal setup,
(or enter the root password for system maintenance)
```

17 Type **`root1`** and press <Enter>.

Note: `root1` is the default root password in Release 4.0. All existing passwords are overwritten with the default Release 4.0 passwords during this upgrade procedure. See Chapter 2, "Before you begin," for Release 4.0 default passwords.

18 At the # prompt, type **`ntkeylock`** to view the License Manager security keylock serial number.

19 Write down the serial number for future use.

20 Type **`mountall`** and press <Enter>.

21 Insert the CD-ROM labeled “OPEN IVR 4.0 Release Supplement CD” into the AP CD-ROM drive.

22 Mount the CD-ROM. Type `mount /dev/cd0 /mnt` and press <Enter>.

23 Read the `readme` file on the CD-ROM and do the following:

a Make note of any patches that need to be installed at this point or at a later time.

b Install any patches that need to be installed now.

c Continue with the next step in this procedure.

24 Unmount the CD-ROM. Type `umount /mnt` and press <Enter>.

25 Reinsert the “Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1” into the AP CD-ROM drive.

26 Remove the mouse from the system using the following substeps:

a Type **`mkdev mouse`** and press <Enter>.

b Select **3** to remove a mouse from the system.

c Select **1** to remove the mouse.

d Select **6** to remove the mouse drivers from the kernel.

e Type **y** to remove the mouse device from the /dev directory.

f Type **n** when prompted to rebuild the kernel.

27 Run **`netconfig`** to configure the LAN card and re-enter the TCP/IP network configuration values on the MRS.

For instructions, see “Replacing a LAN card” on page 17-14.

For LAN card configuration values (I/O address, and so on), refer to the Release 4.0 *Symposium OPEN IVR Planning and Engineering Guide*.

28 Edit the `/etc/hosts` file as follows:

a Restore the information that was there before the upgrade.

b At the end of the lines that identify the IVR servers (including the local server), add the required alias for each server, as follows:

IVR server referenced in the hosts file	Required alias
First AP	nt_ap1
Second AP (if installed)	nt_ap2
First MRS	nt_mrs1
Second MRS	nt_mrs2
Third MRS	nt_mrs3
Fourth MRS	nt_mrs4
MRS/AP	nt_mrsap

For example,

```
10.10.1.1    mrs_name    mrs_name.nt.com    nt_mrs1
```

For instructions, see “Updating the hosts and rhosts files on an MRS” on page 13-15.

29 Ensure that the `./rhosts` file contains the host names of all the other IVR servers in the LAN. See “rhosts files” on page 13-8 and “Updating the hosts and rhosts files on an MRS” on page 13-15.

30 Type **`init 6`** to reboot the system.

The system shuts down and reboots.

31 When the `boot:` prompt appears, press <Enter>.

During the bootup sequence, the following prompt appears:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance):
```

32 Press Ctrl-d.

33 When the login prompt is displayed, log in to the MRS as `root`.

34 If the Disk Mirroring option was purchased, then do the following:

a Install the Disk Mirroring software.

b Register the Disk Mirroring software.

c Install the secondary disk.

d Mirror the root disk.

e Stop the Disk Mirroring install and continue with the upgrade procedure. After the upgrade is completed, activate the Disk Mirroring option.

Note: For instructions, see Chapter 16, "Disk Mirroring option."

35 Install the license file from the primary AP, as follows:

a Insert the diskette labeled "OPEN IVR 4.0 License File Diskette" into the floppy drive on the primary AP.

b On the AP, log in as `root`.

c At the # prompt, type **`install_licenses`** and press <Enter>. The license file on the AP and any connected MRS are updated.

When all systems are updated, a success message is displayed.

d Remove the license file diskette from the floppy drive.

36 On the MRS, at the `/sci` prompt, type **`maint shell`** and press <Enter>.

37 At the # prompt, type **`cd /scripts`** and press <Enter>.

38 To run the installation script, type **`./setup`** at the prompt, and press <Enter>.

39 Select the system type from the menu and press <Enter>.

40 When prompted, select remote host.

41 When prompted, enter the remote host name.

42 When prompted to insert the CD-ROM, press <Enter>.

Several prompts and messages are flashed on the screen. Ignore these prompts and messages. They are part of the setup script.

When the script is completed, it will automatically reboot the system.

43 When the `boot:` prompt appears, press <Enter>.

During the bootup sequence, the following prompt appears:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance):
```

44 Press Ctrl-d.

45 When the login prompt is displayed, log in to the MRS as `root`.

46 Clear VSN volumes using the **`/sci/files/vsn/clear`** option.

47 Use the **`/sci/setup/trkbrd`** option to activate the telco cards.

For D/41ESC, D/160SC-LS, and D/240SC-T1 instructions, see Chapter 19, "Telco interface card installation."

For any other telco cards, refer to the `/sci/setup/trkbrd` and `/sci/config/trunk` sections in the Release 4.0 *Symposium OPEN IVR Service Console Interface Reference Manual*.

48 Perform the software installation and activation for any text-to-speech, speech recognition, or fax options you have purchased. Refer to the Symposium OPEN IVR 4.0 option guides for instructions.

49 At the `/sci` prompt, type **`maint shell`** and press <Enter>.

50 At the # prompt, type **`cd /scripts`** and press <Enter>.

51 Type **`./setup`** to run the installation script.

52 Type **`7`** to install tones and prompts, and press <Enter>.

Wait for # prompt to appear before continuing.

53 If you have installed L&H Text-to-Speech, do the following:

a Type **`cd /scripts`** and press <Enter>.

b Type **`opt.setup`** and press <Enter>.

54 When the setup script has completed, type **`exit`** and press <Enter>.

55 Use **`/sci/maint/restart`** to reboot the system.

56 Return to step 34 in the AP upgrade procedure.

Upgrading the SYNC/570 SDLC host connectivity card

Existing OPEN IVR 2.01 and 2.5 customers need to verify the I/O address settings on the SYNC/570 host card before starting the Symposium OPEN IVR 4.0 upgrade process. There are three different I/O addresses currently in use in the field for the host card: 350, 360, and 310. The I/O address for the host card used in Symposium OPEN IVR 4.0 is 310. To verify the SYNC/570 host card I/O address, use the following procedure.

1 Shut down the system.

2 Remove the SYNC/570 SDLC host card from the system.

3 Check the Switch Block 1 (SW1) on the host card for the following settings:

switch 1 - off	switch 2 - on
switch 3 - on	switch 4 - on
switch 5 - off	switch 6 - off

The above DIP switches are configured for an I/O address of 310.

4 If the host card has the same settings as in step 3, reinstall the host card.

If the host card SW1 setting is different from the settings listed in step 3, reconfigure the host card with the settings listed in step 3. Reinstall the host card.

5 Continue with the Symposium OPEN IVR 4.0 upgrade process.

Replacing the Serial I/O card

A new Serial I/O card will be part of the upgrade package for those customers who use the older version of the Serial I/O card. The following procedure can be used to replace the card:

1 Set the jumper settings of the new Serial I/O card to the following:

- JP1-1 All open
- JP1-2 Pin 2-3 Short IRQ 3
- JP1-3 Pin 1-2 Short IRQ 4
- JP2-1 All Open
- JP2-2 All Open
- JP2-3 Pin 1-2 Short COM2
- JP2-4 Pin 2-3 Short COM1
- JP3-1 All Open
- JP3-2 Pin 2-3 Short LPT2
- JP4-1 Pin 1-2 Short IRQ7
- JP4-2 All Open

2 Disconnect power from the MRS.

3 Remove the chassis cover.

4 If the existing serial I/O card uses a 10 wire ribbon cable for the connection of the second serial port connector, simply remove the I/O card and replace it with the new one. Otherwise continue to the next step.

5 Remove the Serial I/O Card and associated expansion bracket.

6 Remove the alarm cable connector from the expansion bracket.

7 Re-install the alarm cable connector onto the new expansion bracket supplied with the replacement serial I/O card.

8 Install the new serial I/O card and expansion bracket into the system.

9 Reinstall the chassis cover.

10 Continue with the Symposium OPEN IVR 4.0 upgrade process.

Restoring customized files

Restore customized files using the following tools:

Files or data	tool
host templates and SQL database	the backup tool (refer to the Release 4.0 *Symposium OPEN IVR System Administration Guide* for backup tool instructions)
all other files listed in this section	the Symposium OPEN IVR 4.0 backup and restore utility (see “Restoring VSNs or other customized files” on page 15-12)

On an AP

- OPEN IVR applications (`/u/nortel/apps`)
- user function source code (`/u/nortel/exe`)
- customized local IVR databases (`/u/nortel/sys_files`)

  Note: Ensure that you also restore VSNs, as instructed in this chapter, in order that the message contents of the databases are restored.

- SQL database if installed on the AP
- host interface templates (`/u/nortel/3270 or 5250`, and so on)

On an MRS/AP

- VSN volumes (see “VSN Volumes Restoration for MRS/AP” on page 15-21)
- OPEN IVR applications (`/u/nortel/apps`)
- user function source code (`/u/nortel/exe`)
- customized local IVR databases (`/u/nortel/sys_files`)

  Note: Ensure that you also backup VSNs, as instructed in this chapter, in order that the message contents of the databases are restored.

- SQL database if installed on the MRS/AP
- TIFF fax images (`/u/nortel/fax.d/`*`xxx`*), where *xxx* is the name or directory of customized fax images

- customized reports (`/u/nortel/stat.d/`*xxx*), where *xxx* is the name or directory of customized reports
- customized trunk type files (`/usr/vrs/types/`*xxx*), where *xxx* is the name or directory of customized trunk files
- host interface templates (`/u/nortel/3270 or 5250`, and so on)

On an MRS

- VSN volumes (see "VSN Volumes Restoration for MRS/Tower or MRS/Rack" on page 15-29)
- customized trunk type files (`/usr/vrs/types/`*xxx*), where *xxx* is the name or directory of customized trunk files

Restoring Release 4.0 system prompts

On an MRS/AP

The restoration of the Release 2.x VSNs overwrites the Release 4.0 system prompts. To restore the Release 4.0 system prompts, follow these steps:

1. Insert the CD-ROM labeled “Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1” into the MRS/AP CD-ROM drive.
2. Log in to the MRS/AP as `root`.
3. At the # prompt, type **`cd /scripts`** and press <Enter>.
4. Type **`./setup`** to run the installation script.
5. Type **`7`** to install tones and prompts, and press <Enter>.
6. When the setup script completes, remove the CD-ROM from the drive.

On an MRS

The restoration of the Release 2.x VSNs overwrites the Release 4.0 system prompts. To restore the Release 4.0 system prompts, do the following steps:

1. Insert the CD-ROM labeled “Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1” into the AP CD-ROM drive.
2. Log in to the MRS as `root`.
3. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
4. At the # prompt, type **`cd /scripts`** and press <Enter>.
5. Type **`./setup`** to run the installation script.
6. Type **`7`** to install tones and prompts, and press <Enter>.
7. When the setup script completes, remove the CD-ROM from the drive.

Upgrading applications from IVR 2.x

ATTENTION

Integrated IVR (MIVR 2.0) applications must be redone. When they are complete, call Nortel Application Development for assistance.

Upgrading VPF files

Note: Before upgrading your applications, make sure you have saved them all in their current form to a backup.

To upgrade your applications to the Symposium OPEN IVR 4.0 level, follow these steps.

1. Log in to the AP or MRS/AP as `root`.
2. Type **`cd /u/nortel/apps`** and press <Enter>.
3. At the `/u/nortel/apps` prompt, type **`xae -update *.vpf`** and press <Enter>.
4. Change to other directories that contain VPF files and repeat from step 3 until all your applications are updated.

Modifying User Functions

In addition to checking if the `usr_main.c` file has been customized (see "Checking if usr_main.c has been customized" on page 14-13), the following changes are needed to each User Function. These changes can be made without Nortel assistance.

1. Add the following include statement:

   ```
   #include "usr_proto.h"
   ```

2. Replace the line

   ```
   #define MAX_BUFS 10
   ```

   with the line

   ```
   #define MAX_BUFS BUFS_PASSED
   ```

3 Remove the following line:

```
#define MAX_BUF_SIZE 31
```

4 After making these changes, recompile your user function typing the following command:

`make -f usr.make NAME=`*`usr_func`*

where *usr_func* is the name of the user function you wish to create.

5 To test the user function interactively, type **`usr_func -i`** at the prompt, and press <Enter>.

6 Promote the user function to the `/u/nortel/exe` directory by typing the following command:

`make -e -f usr.make NAME=usr_func promote`

Note 1: User function executables must be in the `/u/nortel/exe` directory to be available to applications.

Note 2: For multi-threaded user functions, the name may use a maximum of seven characters. User functions that are not multi-threaded may use a maximum of nine characters.

Updating Vocabulary Identifiers

IVR AP software release 4.0 provides an updated `mvrv.config`. If an existing `mvrv.config` file is found during the install, the original file is preserved as `mvrv.config.SAVE` before the updated `mvrv.config` file is installed. Whenever an OPEN IVR AP release 4.0 application is updated from a previous IVR release, edit the `mvrv.config` file so that the file reflects the information in the MRS software vocabularies. The edits to the `mvrv.config` file must be done before any applications are updated. Otherwise, the Application Editor prompts the developer before loading if unidentified vocabularies are found. If the developer proceeds with the update, the unidentified vocabularies will be defaulted to NONE.

The updated file `mvrv.config` assigns unique identification numbers for both continuous and discrete vocabularies. To update existing applications, select the new token in the VINP cell. Refer to the *Application Development Guide* in the appendix that discusses customization and internationalization for information about selecting tokens.

On the AP, update all Speech Recognition vocabulary packages to match the vocabulary identification entries in the file `mvrv.config` by following these steps.

1 Locate the vocabulary identification number in the file `mvrv.config`. For example, the vocabulary identification number for U.S. English Continuous Digits is 60.

2 Log in to the MRS or MRS/AP as `service`.

3 From the `sci` prompt, type the following command:

```
/sci/files/vocab/vr160> edit
```

and press <Enter>.

The system displays the following prompt:

```
Please enter the vocabulary id for edit:
```

4 At the prompt, type **0** and press <Enter>.

Note: The value 0 is the previous vocabulary identification number for US English continuous digits in the file `mvrv.config`.

The following information is displayed by the system:

```
Current type of vocabulary? = discrete
continuous - Continuous vocabulary
discrete -   Discrete vocabulary
       Type of vocabulary =
```

5 At the prompt, type **`continuous`** and press <Enter>.

The system displays the following information:

```
Default   Enter the new vocabulary ID = 100
          Enter the new vocabulary ID =
```

6 At the prompt, type **`60`** and press <Enter>.

Note: The value 60 is the vocabulary identification number in Symposium OPEN IVR Release 4.0.

7 At the prompt, type **done** and press <Enter>.

The U.S. English continuous digits vocabulary identification number is changed from 0 to 60.

8 Restart the AP for the changes to take effect.

Updating Vocabulary Identifiers in applications

OPEN IVR 4.0 uses different Vocabulary Identifiers than previous releases. This affects the way Voice Recognition portions of your applications function. Refer to the file `/u/nortel/sys_files/mvrv.config` to determine the new ID's that your application should use. Each application using Voice Recognition should modify the application cells such as VINP to use the appropriate Vocabulary Identifiers.

Upgrading ADSI Applications from OPEN IVR 2.01 or 2.5 to Symposium OPEN IVR 4.0

ADSI applications written in OPEN IVR 2.01 and OPEN IVR 2.5 cannot be run in Symposium OPEN IVR 4.0. They must be re-written using the Symposium OPEN IVR 4.0 cells.

In OPEN IVR 2.01 and OPEN IVR 2.5, a custom user function was developed to handle the ADSI functionality. This user function (adsi) can create six different databurst VSN packets and returns as its output the VSN number of the created VSN. This VSN is then played by the PLAY cell to the ADSI phone. Once completed, this VSN is then deleted by a DMSG cell. More specific details of these cells can be found in the OPEN IVR 2.x documentation.

In Symposium OPEN IVR 4.0, the ADSI user function has been replaced with standard ADSI cells that perform all the tasks that the "adsi" user function in OPEN IVR 2.x could do and more. Unlike in OPEN IVR 2.x, only one cell is required when an ADSI task is to be performed.

To convert OPEN IVR 2.x applications to 4.0, replace the 2.x group of cells with the one 4.0 cell as described in Table 14-3. Consideration must be made for all the input and output buffers pertaining to the 2.x cells. These should be handled according to the application.

Table 14-3: Converting a 2.x ADSI application to a 4.0 ADSI application

OPEN IVR 2.x cells	Replace with the following Symposium OPEN IVR 4.0 cell	Comments/Description
USER cell (adsi user function, function code 01) PLAY cell DMSG cell	dsCON	establishes a communications session with an ADSI telephone set
USER cell (adsi user function, function code 02) PLAY cell DMSG cell	dsDIS	terminates a communications session with an ADSI telephone set
USER cell (adsi user function, function code 03) PLAY cell DMSG cell	dsKEYS	downloads up to 6 softkey definitions to an ADSI telephone set
USER cell (adsi user function, function code 04) PLAY cell DMSG cell	dsMENU	downloads a list of menu options to an ADSI telephone set
USER cell (adsi user function, function code 05) PLAY cell DMSG cell	dsINFO	downloads a list of ASCII text lines to an ADSI telephone set
USER cell (adsi user function, function code 06) PLAY cell DMSG cell	dsDATA	downloads a form containing textual prompts and one or more input format patterns to an ADSI telephone screen

In addition to these cells, the following ADSI-specific cells can be used within an ADSI application:

- dsINPUT - receives data from an ADSI telephone set

- dsMODE - sets the application to either VOICE or DATA mode
- dsUSER - provides the application with the capability to access specific low-level commands supported by an ADSI telephone set

A complete description of each ADSI cell can be found in the *Symposium OPEN IVR Cell Catalog*.

Final steps in the upgrade process

Making a backup of the upgraded system

After you have completed the upgrade to your system, make two system image backups of the system. See “Creating a system image backup” on page 15-4. Store one copy on-site and the other with the distributor.

Upgrading the modem on an AP or MRS/AP

A 33.6K or higher speed modem is required for PPP connection to an AP or MRS/AP. Install the 33.6 US Robotics modem if included in the upgrade package. For instructions, see Chapter 11, “Remote access.”

Reinstalling options

Text-to-Speech, Speech Recognition, Fax options

You are instructed to install Text-to-Speech, Speech Recognition, or Fax options during the upgrade from OPEN IVR 2.x to Symposium OPEN IVR 4.0.

SQL client software

Reinstall the SQL client software. Refer to the *Symposium OPEN IVR SQL Server User Guide* for instructions.

Host connectivity

Reinstall the host connectivity software. Refer to the appropriate Symposium OPEN IVR 4.0 host connectivity guide for instructions.

To install the	Refer to
3270/5250 Token Ring or SDLC board	*Symposium OPEN IVR SNA Host Communications Guide*
VT100 board	*Symposium OPEN IVR VT100 Host Connectivity Configuration and Development Guide*

Disk Mirroring option

A Disk Mirroring upgrade requires that you install a new Disk Mirroring package. See Chapter 16, Section B: “Completing the installation” on page 16-11.”

UPS option

For a UPS connected to an AP or MRS/AP, the Powerchute software must be reinstalled. For an MRS, the UPS option in the SCI must be reenabled. See Chapter 9, “Uninterruptible Power Source (UPS) option,” for instructions.

Upgrading from a runtime system to a development system

A runtime system does not support application development. If you have purchased a license for a development system, do the following steps:

1. Log in to the AP or MRS/AP as `root`.
2. At the # prompt, type **`custom`** and press <Enter>.
3. Use the custom utility to enter the license code for development systems as detailed in the *SCO Open Server Handbook.*
4. Exit out of the custom utility.
5. Install the new Symposium OPEN IVR 4.0 license file, as follows:
   - **a** Ensure that the `hosts` and `rhosts` files are up to date. See “Hosts files” on page 13-4 and “rhosts files” on page 13-8.
   - **b** Insert the diskette labeled “OPEN IVR 4.0 License File Diskette” into the floppy drive on the AP or MRS/AP.
   - **c** At the # prompt, type **`install_licenses`** and press <Enter>.
   - **d** Remove the license file diskette from the floppy drive.

Chapter 15: Backup and failure recovery

Overview

CAUTION

To prevent loss of data, perform regular backups. In addition, a system image backup must be performed prior to any change to the hardware, such as replacing or adding cards or SCSI devices, or replacing any internal components in the server.

This chapter is divided into the following sections:

- "Section A: Making a full system image backup of your Symposium OPEN IVR 4.0 system" on page 15-3
- "Section B: Backing up and restoring VSNs and other directories" on page 15-7
- "Section C: Restoring your Symposium OPEN IVR 4.0 system from a system image backup tape" on page 15-15
- "Section D: Restoring a previous release of OPEN IVR" on page 15-19

  This section provides information for restoring your system from a system image backup tape created before beginning the Symposium OPEN IVR 4.0 upgrade. This is only required in the event of a Symposium OPEN IVR 4.0 upgrade failure. For information on creating the system image backup prior to the upgrade, see Chapter 14, "Upgrade procedures."
- "Section E: Disk mirroring failure recovery" on page 15-31

ATTENTION

Store second backup tape with the distributor

A system image backup of each server is included with a new Symposium OPEN IVR 4.0 system. This system image backup tape can be used to restore the system to the state it was in when it was first installed. Store this backup tape in a safe place. Do not use this tape for subsequent backups.

After the installation of a Symposium OPEN IVR 4.0 system, Nortel requests that the installer make a second system image backup tape to be given to your IVR distributor as a precaution against damage to the system image backup tape that is stored on-site.

Any time a backup is required, make a second system image backup tape to be kept by your IVR distributor.

Section A: Making a full system image backup of your Symposium OPEN IVR 4.0 system

Introduction

This section contains information about creating a system image backup of your Symposium OPEN IVR 4.0 system.

Note: This procedure creates a system image backup of the entire system including VSNs, applications, databases, the license file, and the SCO keycode.

Tape drive type and capacity

For the Release 4.0 Tower AP and MRS/AP, the standard tape drive is the Seagate STD28000N 4 Gbyte SCSI Digital Audio Tape (DAT) drive. The tape drive is set for hardware compression to acquire data up to 8 Gbyte.

The standard tape drive for the Release 2.x AP and MRS/AP hardware is the 2.5 GByte Tandberg TDC4200. The Seagate STD28000N 4 Gbyte SCSI Digital Audio Tape (DAT) drive is an option for the Release 2.x AP or MRS/AP hardware.

Backup time required

Unless a tape drive is purchased for the MRS, a private LAN is required to lower the backup time for the MRS. The M RS backup time estimates are for a backup of the MRS to the AP tape drive over a private LAN.

- Release 4.0 AP or MRS/AP - approximately 20 minutes for full system backup
- Release 4.0 MRS backing up to an AP or MRS/AP - approximately 30 minutes for full system backup
- Release 2.x AP or MRS/AP - approximately 20 minutes for full system backup
- Release 2.x MRS backing up to an AP or MRS/AP - approximately 60 minutes for full system backup

Note: Ensure that the amount of data to be backed up is not greater than the capacity of the backup tape. If the backup volume is greater than the backup tape, the system will give an error.

Creating a system image backup

This section provides information required to create a system image backup of the Symposium OPEN IVR 4.0 system.

Note: For previous releases of OPEN IVR, refer to the documentation that was shipped with your system; also, see Chapter 14, "Upgrade procedures."

Creating a full system image backup of the AP, MRS/AP, or MRS

1 Log in as `root` on the AP, MRS/AP, or MRS that you are backing up.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 At the # prompt, type **`init 1`** and press <Enter>.

The system shuts down and displays the following messages:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance) :
```

3 Enter the root password to enter system maintenance mode. See "Accounts and passwords" on page 2-2.

4 Insert a tape into the tape drive.

Note: If you are backing up an MRS and there is no tape drive on the MRS, use the tape drive on the AP. A tape drive is optional for an MRS.

5 At the # prompt, type **`ibr`** and press <Enter>.

The following menu is displayed:

```
SYMPOSIUM OPEN IVR 4.0 Backup and Restore Utility
================================================
Make your choice:
1) Full system backup
2) Backup Files
3) Restore Files
4) Quit
```

6 Type **1** and press <Enter>.

The following prompt is displayed:

```
Is your tape drive located on the same machine as
the data?  (y/n)
```

7 If you are backing up an MRS to a tape drive on an AP, type **n** and press <Enter>. Then go to step 8.

If the tape drive is on the same machine that you are backing up (for example, backing up an AP onto an AP tape drive), type **y** and press <Enter>. Then go to step 12.

8 If you typed **n** at the previous prompt, the following prompt is displayed:

```
Please enter the tape host [nt_ap1]:
```

9 Type the host name of the machine where the tape is located and press <Enter>.

The following message and prompt is displayed:

```
Starting TCP services: pppd snmpd routed

Please enter the name of this machine as it is known
to the tape host [nt_mrs1]:
```

10 Type the host name of the machine that you are backing up and press <Enter>. For example, if you are backing up an MRS, type the host name of the MRS.

The following prompt is displayed:

```
Please make sure a Tape is inserted in the tape
drive of host name, Continue?  (y/n)
```

11 Type **y** and press <Enter>.

12 The procedure begins to back up the entire system, including prompts, VSNs, and applications. For estimated backup times, see “Backup time required” on page 15-3.

Note: Several prompts and messages are flashed on the screen as the backup script executes. Ignore these prompts and messages.

13 When the backup is complete, remove the tape from the drive and store the tape in a secure location.

CAUTION

Label the system image tape with the host name of the machine that was backed up and the date of the backup. Also indicate that the tape holds a full system image.

Ensure that two full system images are created. One will stay on site. The other should go to the distributor.

14 If you are creating system image backups of each server in the system, then repeat this procedure for each server.

Section B: Backing up and restoring VSNs and other directories

Introduction

This section describes how to backup and restore VSNs, applications, and other customized files.

Tape drive type and capacity

See “Tape drive type and capacity” on page 15-3.

Backing up VSNs or other customized files

The procedure in this section allows you to back up any of the following:

- VSN volume A
- VSN volume B
- VSN volume C
- VSN volume D
- Applications
- User function source code
- Local databases
- Fax images
- Customized reports
- Trunk files

Follow the steps below.

1 Log in as `root` on the AP, MRS/AP, or MRS that you are backing up.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 At the # prompt, type **`init 1`** and press <Enter>.

The system shuts down and displays the following messages:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance) :
```

3 Enter the root password to enter system maintenance mode. See “Accounts and passwords” on page 2-2.

4 Insert a tape into the tape drive.

Note: If you are backing up files on an MRS and there is no tape drive on the MRS, use the tape drive on the AP. A tape drive is optional for an MRS.

5 At the # prompt, type **`ibr`** and press <Enter>.

The following menu is displayed:

```
SYMPOSIUM OPEN IVR 4.0 Backup and Restore Utility
================================================
Make your choice:
1) Full system backup
2) Backup Files
3) Restore Files
4) Quit
```

6 Type **2** and press <Enter>.

A list of directories and directory sizes is displayed, followed by a prompt, as in the following example:

```
Your directories contain the following kilobytes of
```

```
data:

 vsnA: n
 vsnB: n
 vsnC: n
 vsnD: n
 Applications: n
 User function source code: n
 Local databases: n
 Fax images: n
 Customized reports: n
 Trunk files: n
Total: n kilobytes

Is your tape drive located on the same machine as
the data?  (y/n)
```

7 If you are backing up files from an MRS to a tape drive on an AP, type **n** and press <Enter>. Then go to step 8.

If the tape drive is on the same machine that you are backing up, type **y** and press <Enter>. Then go to step 11.

8 If you typed **n** at the previous prompt, the following prompt is displayed:

```
Please enter the tape host [nt_ap1]:
```

9 Type the host name of the machine where the tape is located and press <Enter>.

The following message and prompt are displayed:

```
Starting TCP services: pppd snmpd routed

Please enter the name of this machine as it is known
to the tape host [nt_mrs1]:
```

10 Type the host name of the machine that you are backing up and press <Enter>. For example, if you are backing up files from an MRS, type the host name of the MRS.

The following prompt is displayed:

```
This utility can only backup to a single tape
volume, so please use a sufficient tape size.
Please enter the tape size in megabytes (MB)
```

```
[4000]:
```

11 Type the tape size in megabytes and press <Enter>.

The following prompt is displayed:

```
Do you wish to back up all n MB? (y/n)
```

where *n* is the total size of all the listed directories.

12 If you are backing up all the directories listed at the beginning of this procedure, type **y** and press <Enter>. Then go to step 14.

If you are backing up only certain directories, type **n** and press <Enter>. Then go to step 13.

13 Answer the following prompts:

```
Do you wish to back up vsnA? (n KB) (y/n)
Do you wish to back up vsnB? (n KB) (y/n)
Do you wish to back up vsnC? (n KB) (y/n)
Do you wish to back up vsnD? (n KB) (y/n)
Do you wish to back up applications? (n KB) (y/n)
Do you wish to back up user function source code?
(n KB) (y/n)
Do you wish to back up local databases? (n KB) (y/n)
Do you wish to back up fax images? (n KB) (y/n)
Do you wish to back up customized reports?
(n KB) (y/n)
Do you wish to back up trunk files? (n KB) (y/n)
```

14 After responding to the previous set of prompts, the following prompt is displayed:

```
Is the tape in the drive? (y/n)
```

15 Type **y** and press <Enter>.

The screen displays what is being backed up. At the end, the following confirmation message is displayed:

```
Done file backup.
```

16 When the backup is complete, remove the tape from the drive and store the tape in a secure location.

CAUTION

Label the backup tape with the host name of the machine that was backed up and the date of the backup. Also indicate what type of data was backed up (for example, “VSN A”, or “applications”).

Ensure that two backup tapes are created. One will stay on site. The other should go to the distributor.

Restoring VSNs or other customized files

This procedure restores the contents of a backup tape. Specifically, this procedure can be used to

- restore any files that were backed up using this utility (see “Backing up VSNs or other customized files” on page 15-7)
- restore VSNs and other directories that are listed by this utility that were backed up prior to an upgrade from OPEN IVR 2.x to Symposium OPEN IVR 4.0

Follow the steps below.

1 Log in as `root` on the AP, MRS/AP, or MRS where you are restoring files.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 At the # prompt, type **`init 1`** and press <Enter>.

The system shuts down and displays the following messages:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance) :
```

3 Enter the root password to enter system maintenance mode. See “Accounts and passwords” on page 2-2.

4 Insert the appropriate backup tape into the tape drive.

CAUTION

Do not restore from full system image for this procedure. Use the correct tape.

If you are attempting to restore individual files and directories (for example, VSNs), do not use the full system image backup tape. If you do, the data on your hard disk will be damaged. For full system image restore, see the appropriate sections in this chapter.

Note: If you are restoring files to an MRS and there is no tape drive on the MRS, use the tape drive on the AP. A tape drive is optional for an MRS.

5 At the # prompt, type **ibr** and press <Enter>.

The following menu is displayed:

```
SYMPOSIUM OPEN IVR 4.0 Backup and Restore Utility
================================================
Make your choice:
1) Full system backup
2) Backup Files
3) Restore Files
4) Quit
```

6 Type **3** and press <Enter>.

The following is displayed:

```
Preparing to perform File restore

This procedure will restore all files contained on
the tape and overwrite any existing files

Are you sure you want to restore this tape?
 (y/n)
```

7 Type **y** and press <Enter>.

The following prompt is displayed:

```
Is your tape drive located on the same machine as
the data?  (y/n)
```

8 If you are restoring files to an MRS from a tape drive on an AP, type **n** and press <Enter>. Then go to step 9.

If the tape drive is on the same machine where you are restoring files, type **y** and press <Enter>. Then go to step 12.

9 If you typed **n** at the previous prompt, the following prompt is displayed:

```
Please enter the tape host [nt_ap1]:
```

10 Type the host name of the machine where the tape is located and press <Enter>.

The following message and prompt are displayed:

```
Starting TCP services: pppd snmpd routed

Please enter the name of this machine as it is known
```

```
to the tape host [nt_mrs1]:
```

11 Type the host name of the machine where you are restoring files and press <Enter>. For example, if you are restoring files to an MRS, type the host name of the MRS.

The following message and prompt are displayed:

```
Proceeding with File restore.

Is the correct tape in the drive? (y/n)
```

12 Type **y** and press <Enter>.

The screen displays what is being restored. At the end, the following confirmation message is displayed:

```
Done file restore.
```

13 When the backup is complete, remove the tape from the drive and store the tape in a secure location.

14 Run NTTEST. See Chapter 24, “Verification test (NTTEST).”

Section C: Restoring your Symposium OPEN IVR 4.0 system from a system image backup tape

Introduction

This section provides information required to restore your Symposium OPEN IVR 4.0 system from a previously created system image backup tape.

Restoring an AP or MRS/AP

To restore your AP or MRS/AP from a previously created system image backup tape, follow these steps.

1 Insert the tape that contains the system image backup into the tape drive on the AP or MRS/AP.

2 Insert the *boot* diskette labeled "OPEN IVR 4.0 MIT Boot Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS Local, CD Installation/Tape Recovery" into the floppy drive on the AP or MRS/AP and press <Enter>.

3 Shut down and the restart the system. (See "Shutting down the AP or MRS/AP" on page 2-7 for more information.)

After the system powers up, some screen messages are displayed followed by this prompt:

```
Insert root filesystem floppy and press <Return>
```

4 Insert the *root* diskette labeled "OPEN IVR 4.0 MIT Root Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS, CD Installation/Tape Recovery" into the floppy drive on the AP or MRS/AP and press <Enter>.

The following prompt is displayed:

```
Enter client name (Press enter for local
operation):
```

5 Press <Enter>.

The following prompt is displayed:

```
Enter source media (cd or tape):
```

6 Type **tape** and press <Enter>.

The system begins to restore the system image backup. The restore time is required is approximately the same as the backup time required. See “Backup time required” on page 15-3.

When the restoration is completed, the following lines are displayed:

```
** Safe to Power Off **

        - or -

** Press Any Key to Reboot **
```

7 Remove any diskettes from the floppy drive.

8 Remove the system image backup tape and store it in a safe place.

9 Press <Enter> to reboot.

The restoration is complete. Allow the system to bootup normally.

Restoring an MRS

To restore an MRS from a previously created system image backup tape, follow these steps.

1 Insert the tape that contains the system image backup into the tape drive on the AP or MRS/AP.

2 Insert the appropriate *boot* diskette from the following list:

Hardware version	MRS LAN card, or local tape drive	Diskette
Release 2.x MRS	SMC Ethernet card	OPEN IVR 4.0 MIT Boot Diskette 1/1- R2 MRS, SMC Ethernet, CD Installation/Tape Recovery
Release 2.x MRS	Madge Token Ring card	OPEN IVR 4.0 MIT Boot Diskette 1/1 - R2 MRS, Madge Token Ring, CD Installation/Tape Recovery
Release 4.0 MRS	Using tape drive on the MRS	OPEN IVR 4.0 MIT Boot Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS Local, CD Installation/Tape Recovery

3 Shut down and the restart the system. (See “Shutting down the AP or MRS/AP” on page 2-7 for more information.)

After the system powers up, some screen messages are displayed followed by this prompt:

```
Insert root filesystem floppy and press <Return>
```

4 Insert the appropriate *root* diskette from the following list:

Hardware version	MRS LAN card, or local tape drive	Diskette
Release 2.x MRS	n/a	OPEN IVR 4.0 MIT Root Diskette 1/1 - R2 MRS, CD Installation/Tape Recovery
Release 4.0 MRS	n/a	OPEN IVR 4.0 MIT Root Diskette 1/1 - AP, MRS/AP, AP/Rack, R4 MRS, CD Installation/Tape Recovery

5 Press <Enter>.

The following prompt is displayed:

```
Enter client name (Press enter for local
operation):
```

6 If the tape drive is on the MRS, press <Enter>. Otherwise, enter the MRS host name.

The following prompt is displayed:

```
Enter source media (cd or tape):
```

7 Type **tape** and press <Enter>.

8 If the tape drive is on the MRS, go to step 10.

If the tape drive is on the AP, the following prompts are displayed one at a time:

```
Enter client IP address:
Enter server IP address:
Enter client netmask:
```

Note: The client is the MRS and the server is the AP.

9 You are prompted to confirm your responses to the set of prompts listed in step 8. Type **y** and press <Enter>.

10 The system begins to restore the system image backup. The restore time is required is approximately the same as the backup time required. See “Backup time required” on page 15-3.

When the restoration is completed, the following lines are displayed:

```
** Safe to Power Off **

        - or -

** Press Any Key to Reboot **
```

11 Remove any diskettes from the floppy drive.

12 Remove the system image backup tape and store it in a safe place.

13 Press <Enter> to reboot.

The restoration is complete. Allow the system to bootup normally.

Section D: Restoring a previous release of OPEN IVR

Introduction

This section provides the information required to restore your system to a previous release level of OPEN IVR if the upgrade to Symposium OPEN IVR 4.0 fails.

CAUTION

If you are restoring an OPEN IVR 2.x system image, use the MIT diskettes that came with your OPEN IVR 2.x system.

AP or MRS/AP restoration from a system image backup tape

Restoring from the system image backup tape (AP or MRS/AP)

To restore from the backup image tape created on an AP or MRS/AP, follow these steps.

1. Shut down the system if possible. If you cannot shut down, you need to power off.

   To do a shutdown, type **`shutdown -y -g0`** and press <Enter>.

2. Insert the N1 Boot diskette and reboot.

3. When prompted, insert the N2 Root Filesystem diskette applicable to this system (either Seagate or Quantum) and press <Enter>.

4. When prompted, insert the M01 Master diskette and press <Enter>.

   After a few minutes, the system prompts:

   ```
   Is the System Image ready? (y/n)
   ```

5 Insert the backup system image tape, type **y**, and press <Enter>. The installation of the system image will take about 30 minutes.

6 When the image is extracted from the tape, the following message is displayed:

```
You may remove the MIT diskette, it is no longer needed.
```

This message is followed by other messages indicating that the vsn volumes were not restored, and other details regarding the restoration. The final lines should be:

```
** Safe to Power Off **

        - or -

** Press Any Key to Reboot **
```

7 Remove the M01 Master diskette and reboot.

The installation restores the customer applications, database applications, and Express software.

8 For an MRS/AP continue with the following procedure; for an AP, the restore is complete.

VSN Volumes Restoration for MRS/AP

Preparing the MRS/AP for VSNs restoration

The VSN file system must be created and cleared on the MRS/AP system.

To prepare first disk VSN volumes, follow these steps.

1 Use the `fdisk` command to create a third partition. Select **3** for "Use Rest of Disk for UNIX" to create an inactive UNIX file system for VSN volumes.

2 To prepare the new partition, type **`divvy -m /dev/hd03`** at the prompt and press <Enter>.

The system displays the following:

```
There are 160649 blocks in the UNIX area.

Please enter the number of file systems you want this area
to be divided into, or press <Return> to get the default
of 1 file system(s) 1
```

3 For 1 filesystem, type **1** and press <Enter>.

The system displays the following:

```
The layout of the filesystems and swap area is now
prepared.


Do you wish to make any manual adjustments to the sizes
or names of the filesystems or swap area before they are
created on the hard disk? (y/n) y
```

4 Type **y** and press <Enter> to change sizes and names.

The following table and menu are displayed:

Name	Type	New FS	#	First Block	Last Block
	NOT USED	yes	0	0	160648
	NOT USED	no	1	-	-
	NOT USED	no	2	-	-
	NOT USED	no	3	-	-
	NOT USED	no	4	-	-
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
hd03	WHOLE DISK	no	7	0	168682

```
n[ame]    Name or rename a division.
c[reate]  Create a new filesystem on this division.
t[ype]    Select or change filesystem type on new filesystems.
p[revent] Prevent a new filesystem from being created on this division.
s[tart]   Start a division on a different block.
e[nd]     End a division on a different block.
r[estore] Restore the original division table.

Enter your choice or q to quit :
```

5 At the prompt, type **n** to name the new file system and press <Enter>.

The system displays the following prompt:

```
which division? (0 through 7):
```

6 At the prompt, type **0** and press <Enter>.

The system displays the following prompt:

```
what do you want to call it?
```

7 At the prompt, type **vsnA** and press <Enter>.

The system displays the updated table and menu:

Name	Type	New FS	#	First Block	Last Block
vsnA	EAFS	yes	0	0	160648
	NOT USED	no	1	-	-
	NOT USED	no	2	-	-
	NOT USED	no	3	-	-
	NOT USED	no	4	-	-
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
hd03	WHOLE DISK	no	7	0	168682

```
n[ame]    Name or rename a division.
c[reate]  Create a new filesystem on this division.
t[ype]    Select or change filesystem type on new filesystems.
p[revent] Prevent a new filesystem from being created on this division.
s[tart]   Start a division on a different block.
e[nd]     End a division on a different block.
r[estore] Restore the original division table.

Enter your choice or q to quit :
```

8 To create the filesystem you just named, type **c** and press <Enter>.

9 To quit setting up the filesystem, type **q** and press <Enter>.

The following menu is displayed:

```
i[nstall] Install the division set-up shown
r[eturn]Return to the previous menu
e[xit]Exit without installing a division table

Please enter your choice:
```

10 To install the new filesystem vsnA, type **i** and press <Enter>.

11 Reboot the system.

Clearing the vsnA volume

To clear the vsnA volume, use the following steps.

1 Log in as `root` on the MRS/AP.

2 At the prompt, type **`/usr/vrs/tools/sci -b /usr/vrs`** and press <Enter>.

3 At the `sci` prompt, type **`files vsn`** and press <Enter>.

The following menu is displayed:

```
copy - Copy VSN files.
delete - Delete VSN files.
clear - Clear a VSN volume of all VSNs.
usage - Display the VSN volume utilization.
backup - Backup VSNs to a floppy disk.
map - Display the current VSN allocation map.
done - Return to the previous menu.
```

4 At the prompt, type **`clear`** and press <Enter>.

The following prompt is displayed:

```
Default Volume id to clear = 1

Volume id to clear =
```

5 Type **`1`** and press <Enter>.

The following prompt is displayed:

```
Ready to Format Volume 1

Are you sure you wish to clear this volume?

Current continue?  = yes

yes    - Continue with operation.

no     - Return to previous menu.

   continue?  =
```

6 At the prompt, type **`yes`** and press <Enter>.

The system clears the VSN volume. When complete, it displays the following message:

```
VSN Volume Cleared Successfully
```

Restoring VSN files on an MRS/AP

Use the following steps to restore the VSN files.

1 Log in to the MRS/AP as `root`.

2 At the prompt, type **`restore.vsn`** and press <Enter>.

If the VSN volumes are not mounted, the system displays the following prompt:

```
There is no VSN partition mounted
Do you wish to execute “mountall” [ynq]
```

Type **y** and press <Enter>.

3 The system displays the following:

```
Is your tape drive located on the same machine as the data?
[ynq]
```

Type **y** and press <Enter>.

The system displays the following messages:

```
Proceeding with VSN restore.

Is the tape in the drive? [ynq]
```

4 Insert the VSNs backup image tape, type **y** and press <Enter>.

All files that are restored are displayed on the screen. When the restore is complete, the system displays the following message:

```
Done VSN restore.
```

5 Remove the tape from the drive.

6 Synch the VSNs using the `vsn` tool. See the *Symposium OPEN IVR System Administration Guide* for instructions.

MRS/Tower or MRS/Rack restoration from a system image backup tape

MIT process preparations for MRS/Tower or MRS/Rack restoration

The following procedure must be done prior to restoring an MRS/Tower or MRS/Rack.

1 If the system has a failed disk, ensure that the replacement 1 Gbyte Seagate drive is already installed in the MRS. Refer to "Replacing a failed disk on the MRS/Rack" on page 8-68 in the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

2 Attach a TTY terminal, keyboard, and null modem cable.

3 Check that the AP and MRS LAN is operational.

4 Obtain the following:

1	MRS Version 3.00 M01 Master Install Diskette	SMC Ethernet	NT3R6701/A0653095
		Madge Token Ring	NT3R6801/A0653104
2	MRS Version 3.00 N2 Root Diskette	SMC Ethernet	NT3R6703/A0653097
		Madge Token Ring	NT3R6803/A0653107
3	MRS Version 3.00 N1 Boot Diskette	SMC Ethernet	NT3R6702/A0653096
		Madge Token Ring	NT3R6802/A0653106
4	The last MRS system image backup tape		
5	The latest VSN file backup tape or diskettes		

CAUTION

The N1, N2, and M01 diskettes above are *not* the SCO UNIX diskettes in the SCO UNIX boxes. These are special diskettes built in the factory and shipped with the system.

5 Make sure that on the AP the following entry is in the `/etc/hosts` file. This is the default node name and address the MRS will be known as within MIT.

205.172.58.111 VK00000

If the MRS's host name before MIT process happens to be "vk00000" (lower case vk), that entry in the `/etc/hosts` file will have to be commented out.

6 The AP host name and IP address has to be set to the following values due to the nature of the MIT process. As the following changes are made, make note of what the values were before the change since the system must be returned to these original values at the end of this process. If they are not set as the values below, do the following:

a Log in to the AP as `root`.

b Run **`netconfig`** to modify the existing host name and addresses to the following host name and addresses:

```
   AP's Host name:   aurora
   AP's IP address:    205.172.58.219
   AP's IP Netmask Address:   255.255.255.0
   AP's IP Broadcast Address: 205.172.58.255
 Domain:   aurora.default.com
```

For more information on the netconfig utility, see "Modifying the host name and IP address" on page 13-10.

c To activate the new set of network addresses, type **`tcp stop`** and press <Enter>, then type **`tcp start`** and press <Enter>.

Note: If more than one MRS is connected to the AP, the MIT procedure is recommended to be conducted at night since it will make the applications running on other MRSs connected to the same AP unavailable during the MIT process.

Restoring from the system image backup tape (MRS/Tower or MRS/Rack)

To restore from the backup image tape created on an MRS/Tower or MRS/Rack, use the following procedure.

1. Ensure that the steps in "MIT process preparations for MRS/Tower or MRS/Rack restoration" on page 15-25 have been completed, including changing the AP's host name and IP address to the MIT required system configuration.
2. Shut down the MRS if possible and then power off. If you cannot shut down, then just power off.

   To do a shutdown, type **`shutdown -y -g0`** and press <Enter>.
3. Plug the terminal cable into port B and attach the TTY terminal.
4. Reset the terminal connection to 8 bits, no parity. This is required only for the restore procedure.
5. Insert the N1 Boot diskette and then power up.
6. When prompted, insert the N2 Root Filesystem diskette applicable to this system (either Seagate or Quantum) and press <Enter>.
7. When prompted, insert the M01 Master diskette and press <Enter>.
8. After a few minutes, the system prompts:

   ```
   Please enter the HOSTNAME of the local machine:
   Please enter the IP ADDRESS of the local machine:
   Please enter the IP NETMASK of the local machine:
   Please enter the IP BROADCAST of the local machine:
   Please enter the Domain Name of the local machine:
   ```
9. Enter the appropriate values for each prompt. Next, the system prompts:

   ```
   Is the System Image Ready? (y/n)
   ```
10. Insert the backup system image tape, type **`y`**, and press <Enter>.

11 The system prompts for the host name and the path name for the System Image. Press <Enter> to accept the defaults for both prompts.

```
Enter the hostname (aurora):<Return>
Enter the Pathname of the System Image (/dev/rStp0):
<Return>
```

Some further messages are displayed, ending with the following line:

```
Extracting Image from the tape, it will take a few
minutes.
```

This step will take approximately 30 minutes.

12 When the image is extracted from the tape, the following messages are displayed:

```
You may remove the MIT diskette, it is no longer needed.

It appears that MIT configuration has already been run.

Removing /.mitdir...

umount: /dev/vsnB not mounted

umount: /dev/vsnA not mounted
```

More messages are displayed, followed by:

```
** Safe to Power Off **

        - or -

** Press Any Key to Reboot **
```

13 Remove the M01 Master diskette and reboot.

14 Reset the terminal connection to 7 bits, even parity.

15 Change the content in the AP `/etc/hosts` file back to what it was prior to this restoration.

16 Reboot the system. During this first MRS bootup, ignore any '`Could not mount partition xxx`' warnings that may be displayed.

VSN Volumes Restoration for MRS/Tower or MRS/Rack

Preparing the MRS/Tower or MRS/Rack for VSNs restoration

When restoring the VSN volumes using this method, the VSN file systems must be created and cleared on the MRS system. For more information on preparing VSN volumes for the MRS, see Chapter 21, “Software installation,” in the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

To clear the VSN volumes, log in as `root`, access the `sci/files/vsn` menu, and select the `clear` option. This means that if there are two VSN volumes on the MRS system, the vsnA and vsnB have already been mounted under the `/vrs/vsn` directory with `root` as the owner and `root` as the group.

Other VSN volumes (vsnC and vsnD) are not mounted and have `root` as owner and `vrs` as group. If you do not have a `fax` directory on the MRS and you know there are fax files backed up, create a `fax` directory under `/vrs/vsn` with owner `root` and group `other`.

Restoring VSN files on an MRS/Tower or MRS/Rack

To restore the VSN files, follow these steps.

1 Log in to the AP as `root` (password is `openivr`).

2 On the AP, create a `/.rhosts` file in the Nortel account that contains the MRS node name.

3 After editing the `/.rhosts` file, type **`chmod 700 /.rhosts;chown root /.rhosts`** at the root prompt and press <Enter>.

This command sets the correct ownership and permissions.

4 Log in to the MRS as `root`.

5 At the `/sci` prompt, type **`maint shell`** and press <Enter>.

6 At the prompt, type **`restore.vsn`** and press <Enter>.

If the VSN volumes are not mounted, the system displays the following prompt:

```
There is no VSN partition mounted
Do you wish to execute “mountall” [ynq]
```

Type **y** and press <Enter>.

7 The system displays the following:

```
Is your tape drive located on the same machine as the data?
[ynq]
```

Type **n** and press <Enter>.

The system displays the following messages:

```
Please enter the tape host [nortel]:
```

8 Enter the tape host name and press <Enter> (or press <Enter> to accept the default).

The system displays the following messages:

```
Proceeding with VSN restore.

Is the tape in the drive? [ynq]
```

9 Insert the VSNs backup image tape, type **y** and press <Enter>.

All files that are restored are displayed on the screen. When the restore is complete, the system displays the following message:

```
Done VSN restore.
```

10 Remove the tape from the drive.

Section E: Disk mirroring failure recovery

Overview

The event logs report Disk Mirroring error messages.

If a mirrored disk has failed, follow the steps in “Rebuilding a defective root or secondary disk” on page 15-31.

If the disk is still defective, then replace the failed disk as described in “Replacing a defective root or secondary disk” on page 15-32.

Rebuilding a defective root or secondary disk

Follow the steps in this section to assess if a disk is defective, and to attempt to rebuild the defective disk.

1 Check the `event.log` file in the directory `/u/nortel/log.d` to see which drive has failed.

2 Attempt to shut down the system gracefully (if the system is operational); if the system does not shut down, turn off the power.

3 Check cabling (SCSI or power) to the failed disk.

If the cables are loose or detached, reattach the cables and turn the power on. Once the system is operational, check the event log. If disk mirroring is functional, the procedure is complete.

If disk mirroring is not functional at this point, repeat step 2 and then continue from step 4.

4 Log in as `root` on the AP, MRS/AP, or MRS that you are repairing.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

5 At the UNIX prompt, type **`init 1`** and press <Enter>.

The system shuts down and displays the following messages:

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance) :
```

6 Type **root1** and press <Enter>.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **maint shell** and press <Enter>.

7 Try to rebuild the mirror manually. At the prompt, type **/etc/mirror -Gm0** and press <Enter>.

Note: The STAR documentation (provided with the system) provides comprehensive analysis and explanation of the states of the mirror and the `/etc/mirror` command.

8 After attempting to rebuild the mirror, if the mirror does not show intact (the event log returns nothing) or if the mirror does not show that it is regenerating, then shut down the system and follow the steps in "Replacing a defective root or secondary disk" on page 15-32.

Replacing a defective root or secondary disk

WARNING

The root and secondary disks must have identical capacity, performance, and type. Ideally, use the same model from the same manufacturer for each disk.

Attempt to rebuild the defective disk as described in "Rebuilding a defective root or secondary disk" on page 15-31 before deciding if the defective disk must be replaced.

To replace a defective root or secondary disk on your system,

1 Ensure the replacement disk is prepared ahead of time as described in "Preparing the replacement hard disk" on page 15-33.

2 Install the replacement disk as described in "Installing the replacement hard disk" on page 15-33.

Preparing the replacement hard disk

1. Obtain a replacement hard disk that is identical to the remaining good hard disk.
2. Remove the replacement disk's partition table using the `fdisk –f /dev/rdsk/1s0` command.

   Note: If Disk Mirroring errors occur after the secondary disk is installed and mirrored, perform a low-level format of the secondary disk to ensure that the previous partition table is removed. A low-level format of a 4.5 Gbyte hard disk may take eight hours or more. See "Performing a low-level format on a hard disk" on page 15-33.
3. Continue with the steps in "Installing the replacement hard disk" on page 15-33.

Installing the replacement hard disk

1. Remove the failed drive. See Chapter 22, "Replacing or adding a hard disk or media drive."
2. Install the replacement disk with the same SCSI configuration as the disk being replaced. See Chapter 22, "Replacing or adding a hard disk or media drive."
3. If the replacement disk is the secondary disk, then simply boot the system and the mirror will automatically be regenerated.

   If the replacement disk is the root disk, then you must boot the system off of a valid boot floppy (such as the emergency floppy provided with the system).

   a. At the `boot:` prompt, type **`hd(104)unix auto`** and press <Enter>. The system will boot off the slave drive and then automatically regenerate the root mirror.

Performing a low-level format on a hard disk

A low-level format of a 4.5 Gbyte hard disk may take eight hours or more. To do a low-level format on a hard disk, follow these steps.

1. Ensure that the MRS is shut down and powered off.
2. Unplug the MRS power cord.
3. Remove the hard disk from the MRS.
4. Shut down and power off an AP or MRS/AP system.

5 Unplug the AP or MRS/AP power cord.

6 Disconnect the SCSI cable and the power cable from the tape drive on the AP or MRS/AP.

7 Connect the SCSI cable and the power cable to the hard disk you removed from the MRS.

8 As an additional precaution, remove all the MRS/AP or AP hard disks.

9 Plug in the AP or MRS/AP power cord.

10 Boot the AP with a DOS diskette.

11 Insert the diskette, labeled “MRS V3.02 Low Level Formatting Utility” (part number A0684420 - NT2R69AA), into the floppy drive.

12 At the DOS prompt, type **`7870cfg`** and press <Enter>.

13 Select `SCSI Disk Utilities` from the `Options` menu.

14 Wait until the hard disk has been detected by the system.

15 At the prompt, select the hard disk model as displayed.

16 At the prompt, choose the `format` option.

Note: Formatting a 4.5 Gbyte hard disk may take eight hours or more to complete.

17 Exit the utility. Press <Esc> twice and confirm the exit when prompted.

18 Power off the system.

19 Unplug the AP or MRS/AP power cord.

20 Disconnect the MRS hard disk; reconnect the tape drive and the other hard disks on the AP or MRS/AP.

21 Place the formatted MRS hard disk in the MRS.

22 Plug in the MRS power cord.

23 Power up the MRS.

24 Plug in the AP or MRS/AP power cord.

25 Power up the AP or MRS/AP.

Chapter 16: Disk Mirroring option

Introduction

The Symposium OPEN IVR Disk Mirroring option provides a disk-mirroring capability in order to maintain the integrity of system data and to reduce downtime. The Disk Mirroring option provides greater data reliability. This option is available on both the AP, MRS/AP, and MRS.

The disk-mirroring environment consists of two hard disks with the same physical capacity. The primary disk is called the root disk. The function of the parity or secondary disk is to retain a copy or mirror image of the contents of the root disk. In the case of either disk failing, the other (mirror) disk retains a copy of all of the data prior to the disk failure. This process prevents loss of critical data and allows the system to continue operating. At a convenient time, the failed disk is replaced, and the contents of the valid disk are copied to the new disk, thereby maintaining the integrity of the mirror function.

The STAR software mirrors the entire disk including all UNIX and non-UNIX partitions (Any DOS, boot, and swap partitions are also mirrored). The mirror is set up once for the entire disk. No maintenance is required.

Reference documentation

For additional information on the Disk Mirroring option, refer to the Star Technologies/Western Micro Technology, Inc. DMX (Disk Management Extension) Manual.

Tape backups

Perform regular tape backups as an additional precaution. See Chapter 15, “Backup and failure recovery."

Disk Mirroring serial number and certificate

Retain the Disk Mirroring serial number and certificate for future use, and store in a safe place. Please enter the Disk Mirroring serial number here for easy reference.

Disk Mirroring serial number (one for each server with Disk Mirroring):

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

Disk Mirroring option requirements

Have the following components available before you begin installation.

- a license file that includes the appropriate Disk Mirroring functionality for each IVR server that will have the Disk Mirroring option
- a secondary hard disk that is the same type as the root disk, with identical capacity and performance. Ideally, use the same model from the same manufacturer for each disk.
- installation software that corresponds to the IVR servers that will have the Disk Mirroring option, as listed in Table 16-1

Table 16-1: IVR server and corresponding CD-ROM

IVR server	CD-ROM title
Release 2.x AP or MRS/AP Release 4.0 AP or MRS/AP Release 4.0 MRS	Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1
Release 2.x MRS	Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1

Installation roadmap

To install Disk Mirroring, complete the steps in the following roadmap for each server that is adding Disk Mirroring.

Installation roadmap		
Step	**What to do**	**How to do it**
1	Install Disk Mirroring software	“Installing the Disk Mirroring software” on page 16-5
2	Register the Disk Mirroring software	“Registering the Disk Mirroring STAR software with Star Technologies/Western Micro” on page 16-8
3	Physically install the secondary hard disk	“Physically installing the secondary hard disk” on page 16-9
4	Mirror the root disk	“Mirroring the root disk” on page 16-10
5	For AP	“Completing the installation for the AP Disk Mirroring option” on page 16-11
6	For MRS or MRS/AP	“Completing the installation of MRS or MRS/AP Disk Mirroring” on page 16-11
7	Install the license file for all servers that have added Disk Mirroring	“Installing the license file” on page 16-15

Section A: Installing the Disk Mirroring software and hardware (AP, MRS/AP, or MRS)

Introduction

Before installing this option, verify that you have the requirements listed in “Disk Mirroring option requirements” on page 16-2.

This procedures in this section must be performed on each server that has the Disk Mirroring option.

The procedures are:

- “Installing the Disk Mirroring software” on page 16-5
- “Registering the Disk Mirroring STAR software with Star Technologies/Western Micro” on page 16-8
- “Physically installing the secondary hard disk” on page 16-9
- “Mirroring the root disk” on page 16-10

Installing the Disk Mirroring software

Installing from a CD-ROM drive on the same machine

Note: Follow this procedure if the machine that is adding Disk Mirroring has a CD-ROM drive. If you are installing Disk Mirroring on an MRS that does not have a CD-ROM drive, go to "Installing from a CD-ROM drive on a remote server" on page 16-6.

Follow these steps:

1. Ensure that you have performed a full backup of the server you are working on. See "Creating a system image backup" on page 15-4.

2. Log in as `root` on the AP, MRS/AP, or MRS that is adding Disk Mirroring.

   Note: The CD-ROM drive must be on the same machine that is adding Disk Mirroring. If you are installing from a remote CD-ROM drive, go to "Installing from a CD-ROM drive on a remote server" on page 16-6.

3. At the # prompt, type **`init 1`** and press <Enter>.

   The system shuts down and displays the following messages.

   ```
   Type CONTROL-d to proceed with normal startup,
   (or give root password for system maintenance) :
   ```

4. Type **`root1`** and press <Enter>.

5. Insert the appropriate CD-ROM from this list into the local CD-ROM drive:

IVR server	CD-ROM title
Release 2.x AP or MRS/AP Release 4.0 AP or MRS/AP Release 4.0 MRS	Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1
Release 2.x MRS	Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1

6. At the # prompt, type **`mount /dev/cd0 /mnt`** and press <Enter>.

7 Type **cp /mnt/custom/star_dmx/stardmx /tmp/VOL.000.000** and press <Enter>.

8 Complete the installation by following the steps in "Completing the Disk Mirroring software installation" on page 16-7.

Installing from a CD-ROM drive on a remote server

Note: Follow this procedure if you are installing Disk Mirroring on an MRS that does not have a CD-ROM drive. This procedure copies the required files from the CD-ROM drive on the AP.

Follow these steps:

1 Ensure that you have performed a full backup of the server you are working on. See "Creating a system image backup" on page 15-4.

2 Log in to the AP as `root`.

3 At the # prompt, type **init 1** and press <Enter>.

The system shuts down and displays the following messages.

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance) :
```

4 Type **root1** and press <Enter>.

5 Insert the appropriate CD-ROM from this list into the CD-ROM drive on the AP:

IVR server	CD-ROM title
Release 2.x AP or MRS/AP Release 4.0 AP or MRS/AP Release 4.0 MRS	Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation AP, MRS/AP, R4 MRS, CD 1 of 1
Release 2.x MRS	Symposium OPEN IVR 4.0, IVR and Operating Software and Documentation R2 MRS, CD 1 of 1

6 At the AP # prompt, type **mount /dev/cd0 /mnt** and press <Enter>.

7 At the AP # prompt, type **cp /mnt/custom/star_dmx/stardmx /tmp/VOL.000.000** and press <Enter>.

8 Log in as `root` on the MRS that is adding Disk Mirroring.

9 At the `/sci` prompt, type **`maint shell`** and press <Enter>.

10 Use `ftp` to log in to the AP (for instructions on using `ftp`, see “ftp command” on page B-3).

11 Use the `get` command, as follows:

```
ftp> get /tmp/VOL.000.000 /tmp/VOL.000.000
```

12 At the `ftp>` prompt, type **`quit`** and press <Enter>.

13 Complete the installation by following the steps in “Completing the Disk Mirroring software installation” on page 16-7.

Completing the Disk Mirroring software installation

1 Type **`scoadmin`** and press <Enter> to run the Software Manager interface.

2 Using the space bar and arrow keys, select **`Software`** → **`Install New`**.

3 At the `Continue` prompt, select <*> **`From`** ***`hostname`*** and press <Enter> on `Continue` **(**where *`hostname`* is the local host name).

4 Select media device as **`Media Image`** and press <Enter> on `Continue`.

5 Enter **`/tmp`** as the location of the image.

6 When the Select a Product window appears, select **`DMX`** and press <Enter> on `Install` to continue.

7 When prompted, enter the Star DMX serial number (as indicated in the STAR DMX documentation provided with the system) and press <Enter>.

8 When asked for the serial number of DMX Stripe, press <Enter>. Do *not* enter a serial number at this prompt.

9 At the prompt `Do you want to install a DMX Stripe demo copy?`, type **`n`** and press <Enter>.

10 At the `OK?` prompt, press <Enter>.

11 Press <Enter> again to continue.

The installation of the Star DMX Disk Mirroring begins. This process takes several minutes.

12 The kernel needs to be rebuilt. For the next three prompts, type **`y`** and press <Enter>.

13 Press <Enter> on OK to continue.

14 At the menu, select **Host ‡ Exit** to exit from the Software Manager.

15 To provide automatic regeneration of the mirror when the system restarts, add the following line to the end of the `/etc/dmxstart` file: `'/etc/mirror -Gm0'`

16 Type **shutdown –y –g0 –i6** and press <Enter>.

Continue with the remaining steps in the installation. See “Installation roadmap” on page 16-3.

Registering the Disk Mirroring STAR software with Star Technologies/Western Micro

The DMX Software must be registered within 30 days of installation. DMX products are fully functional for this grace period as long as a valid serial number is entered during installation.

1 Log in as `root` on the AP, MRS/AP, or MRS that is adding Disk Mirroring.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **maint shell** and press <Enter>.

2 At the # prompt, type **cd /etc** and press <Enter>.

3 Type **reggie** and press <Enter>.

The reggie program will attempt to gain access to a dial out modem and dial the central registration system. The registration request will be transmitted and if successful, the Registration Code is automatically entered into the system.

Physically installing the secondary hard disk

See Chapter 22, “Replacing or adding a hard disk or media drive," for instructions on installing a second hard disk.

Set the secondary disk to SCSI ID=l.

Note 1: The root and secondary disks must have identical capacity, performance, and type. Ideally, use the same model from the same manufacturer for each disk.

Note 2: Ensure that the secondary disk’s partition table is empty. This can be verified with the `fdisk –f /dev/rdsk/1s0` command.

Note 3: If Disk Mirroring errors occur after the Disk Mirroring installation is completed, then perform a low-level format of the secondary disk to ensure that the previous partition table is removed and then reboot the server. A low-level format of a 4.5 Gbyte hard disk may take eight hours or more. See “Performing a low-level format on a hard disk” on page 15-33.

Mirroring the root disk

To set up the mirrored disk on an OPEN IVR 4.0 system, follow these steps.

1 Log in as `root` on the AP, MRS/AP, or MRS that is adding Disk Mirroring.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 At the # prompt, type **`init 1`** and press <Enter>.

The system shuts down and displays the following messages.

```
Type CONTROL-d to proceed with normal startup,
(or give root password for system maintenance) :
```

3 Type **`root1`** and press <Enter>.

4 At the # prompt, type **`/etc/mirror`** and press <Enter>.

5 Select `Build a Mirror` from the menu.

6 At the prompt

FOR	TYPE	AND PRESS
Master Device name	**/dev/dsk/0s0**	<Enter>
Slave Device name	**/dev/dsk/1s0**	<Enter>

7 Relink the kernel and then reboot the system. At the prompts `boot by default?` and `kernel environment rebuilt?`, type **`y`** and press <Enter>.

8 After you relink the kernel, shut down and reboot the system. Type **`shutdown –y –g0 –i6`** and press <Enter>.

9 Once the system boots up properly, go to “Section B: Completing the installation” and follow the instructions for AP or MRS Disk Mirroring. For an MRS/AP, follow the instructions for MRS Disk Mirroring.

Section B: Completing the installation

Completing the installation for the AP Disk Mirroring option

There is only one step necessary to complete the AP Disk Mirroring installation: activating Disk Mirroring in the AP environment.

Activating the AP Disk Mirroring option

To activate the AP Disk Mirroring option, follow these steps:

1. Log in to the AP as `nortel`.
2. From the Control Panel, select `System Config Management` and place the window appropriately on the screen.
3. Under the Node Configuration menu, change the response for the query about "AP Disk Mirroring Support?" from NO to YES.
4. Exit and save the changes to the configuration manager.
5. Exit from the Control Panel.
6. Continue with the steps in "Installing the license file" on page 16-15.

Note: The AP event log file reports Disk Mirroring messages.

Completing the installation of MRS or MRS/AP Disk Mirroring

To complete Disk Mirroring installation, complete the following procedures.

1. Install the Disk Mirroring option on the MRS or MRS/AP.
2. Activate the Disk Mirroring option.

Installing the Disk Mirroring option on the MRS or MRS/AP

Follow the steps below.

1. Log in to the MRS or MRS/AP as `root`.

   Note: On an MRS/AP, you have to start the SCI after logging in. Type **`sci.start`** and press <Enter>.

2. At the `/sci` prompt, type **`install`** and press <Enter>.

3 Type **package** and press <Enter>.

The system displays the following options:

```
   Select Media Device:
. . . . . .
1. CD-ROM
2. Hard Disk(local installs only)
3. Floppy Disk(local installs only)

Please enter your selection or q to quit []:
```

4 Select 1 and press <Enter>.

The system displays the following options:

```
Specify which host machine installing FROM and TO:
. . . . . .
1.  FROM localhost TO localhost
2.  FROM remote host To localhost
3.  FROM localhost TO remote host
Please enter your selection or q to quit []:
```

5 Make your selection depending on where the CD-ROM is located and press <Enter>. If you select 2 or 3, you will see the prompt for the host name of the remote machine.

Note: Enter the full domain name if necessary.

After the host information is gathered, you see the prompt:

```
Enter "c" to continue, "r" to redo, or "q" to quit
```

Type **c** and press <Enter> to continue.

6 The system displays the following prompt:

```
Insert installation CD into CD-ROM drive at host
=> localhost.
Type q to quit or hit ENTER to continue:
```

Note: The `localhost` name shown above may be another host name, depending on the type of installation.

7 Insert the CD into the CD-ROM drive and press <Enter> to continue.

The system displays the following prompt:

```
Specify which packages will be installed:
(Enter y or n to select packages, or q to quit)

AP . . . . . [n]?
MRS . . . . . [n]?
License Manager . . . . [n]?
Enter "c" to continue, "r" to redo, or "q" to quit:
```

8 Type **y** for the MRS selection (this also works for MRS/AP). Type **c** and press <Enter> to continue.

The system displays the following prompt:

```
Select the MRS packages to be installed:
-------------------------------------------------
System packages . . . . [n]?
```

9 Type **y** and press <Enter> to select the System Packages option.

The system displays the following:

```
Base Package for SCBus. . . . . [n]?
Base Package for PEB. . . . . [n]?
Dialogic System Release 4.2 . . . . . [n]?
Dialogic Country Specific Parameters. [n]?
System Configuration. . . . . [n]?
System Panel Driver . . . . . [n]?
Star MRS Disk Mirroring Option. . . [n]?
```

10 For the Disk Mirroring Option, type **y** and press <Enter>. (Press <Enter> through the other option install prompts to accept the default.)

The system displays the following prompt:

```
Enter "c" to continue, "r" to redo, or "q" to quit:
```

11 To continue, type **c** and press <Enter>.

12 If the Disk Mirroring option has been previously installed, you see the prompt to replace the original copy. Type **y** and press <Enter> to continue.

The system installs the Disk Mirroring option and provides informational messages during the installation. When the installation is complete, the system displays the following messages:

```
Installation complete.
The installation of the Disk Mirroring option is
now complete.

Press ENTER to continue or "q' to quit:
```

13 Type **q** and press <Enter> to quit.

14 At the `/sci/install>` prompt, type **`restart`** and press <Enter>.

The system shuts down and then automatically reboots.

15 Continue with the steps in “Activating the MRS or MRS/AP Disk Mirroring option” on page 16-14.

Activating the MRS or MRS/AP Disk Mirroring option

After the Disk Mirroring option is installed, activate the option using the following steps.

1 Log in to the MRS or MRS/AP as `service`.

2 At the `/sci` prompt, type **`setup`** and press <Enter>.

3 At the `/sci/setup` prompt, type **`syscfg`** and press <Enter>.

The SCI displays prompts for the installed system options.

4 At the prompt `Current Disk Mirroring Option = disabled`, type **`star`** and press <Enter> to activate the Disk Mirroring option.

5 Continue with the steps in “Installing the license file” on page 16-15.

Installing the license file

Note: The license file installation procedure updates the license file on all IVR servers in the same LAN. Therefore, if you are installing Disk Mirroring on more than one IVR server in the same LAN, then you need to execute this procedure only one time for all servers. This procedure can be executed before Disk Mirroring is installed on any of the IVR servers.

To install the license file, follow these steps:

1. Ensure that the `hosts` and `rhosts` files are up to date. See “Hosts files” on page 13-4 and “rhosts files” on page 13-8.
2. Insert the diskette labelled OPEN IVR 4.0 License File Diskette into the floppy drive on the primary AP. The license files on all IVR servers in the same LAN will be updated from the floppy drive on the AP.
3. On the AP, log in as `root`.
4. At the # prompt, type **`install_licenses`** and press <Enter>.
5. Remove the license file diskette from the floppy drive and store in a safe place.

Chapter 17: LAN card installation

Overview

This chapter describes installing and configuring LAN cards in a Symposium OPEN IVR system. The following specific topics are described:

- "Release 2.x hardware platforms" on page 17-2
- "Installing the 3Com Ethernet card" on page 17-3

  The 3Com PCI Ethernet 3C900-Combo card will be referred to as the 3Com Ethernet card in the remainder of this chapter.
- "Installing the Madge ISA Token Ring card" on page 17-9
- "Network configuration" on page 17-14

If there are differences among AP, MRS/AP, or MRS installation, they are noted within the procedures.

Referenced documentation

If necessary to configure the LAN card, refer to the *Symposium OPEN IVR Planning and Engineering Guide* for LAN card configuration values.

Integrated Package for Meridian Link (IPML) LAN card requirements

An Ethernet card in the Symposium OPEN IVR system can support the requirements of the IVR system and IPML. If the IVR system is using a Token Ring card, then a separate Ethernet card is required for communication with the Meridian 1 switch. Refer to the *Integrated Package for Meridian Link User Guide* for details.

If the IVR system has an Ethernet card, a second Ethernet card for IPML is optional.

Release 2.x hardware platforms

For instructions on replacing LAN cards in Release 2.x hardware, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

To configure a LAN card after it is installed in the Release 2.x hardware platform, see “Network configuration” on page 17-14 in this manual.

Installing the 3Com Ethernet card

This section provides procedures for

- card installation
- cabling

3Com Ethernet card installation (AP, MRS/AP, or MRS)

The following steps describe how to install a LAN card.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and power off the unit you are working on. (For information on shutting down the system, see “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8.)

3 Unplug the power cord for the unit from the electrical outlet.

4 Remove the cover from the unit (see Chapter 21, “Replacing hardware components”).

5 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

6 The appropriate slot depends on the server, as follows.

   a Tower AP, Rack AP, or MRS/AP — PCI slot 1 for the first Ethernet card, PCI slot 2 for the second Ethernet LAN card if requested for IPML or host connectivity. If you are installing a 3Com Ethernet card, it will support IVR LAN, host connectivity, and IPML, so a second LAN card specifically for IPML or host connectivity is optional.

   b MRS/Tower or MRS/Rack — PCI slot 2

7 Remove the slot's retaining screw. If the slot is empty, remove the slot cover. If you are replacing a card in this slot, remove the card.

8 Use the slot's card guides as you insert the card edge connector into the slot. Press firmly until the card is securely seated in the slot.

9 Replace and tighten the retaining screw to secure the card.

10 Reinstall the cover for the unit (see Chapter 21, "Replacing hardware components").

11 Connect the customer's LAN cable to the LAN card (see "Connecting the 3Com Ethernet card to the LAN" on page 17-4).

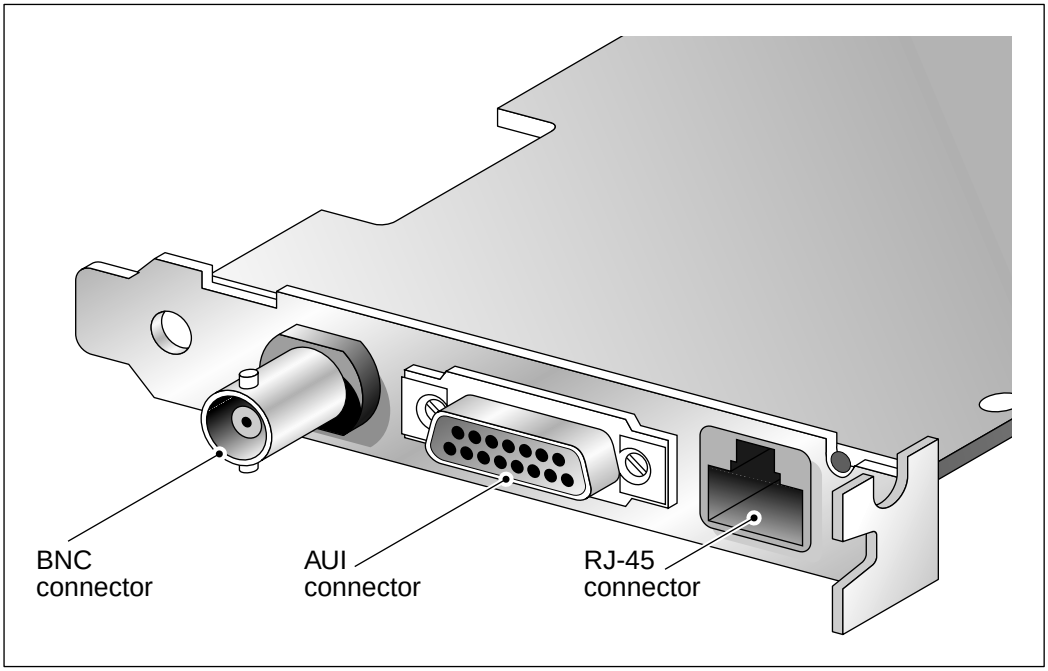
Connecting the 3Com Ethernet card to the LAN

Table 17-1 lists the connectors available on the 3Com Ethernet card for the various LAN cable types.

Table 17-1: 3Com Ethernet card cable connectors

LAN cable type	3Com Ethernet card backplate connector
shielded twisted-pair	RJ-45
Thick coaxial	AUI
Thin coaxial	BNC

Figure 17-1: 3Com Ethernet card cable connectors



To connect the card to the LAN cable and complete the installation, follow the steps below:

1 Look at the existing connector on the customer's LAN cable to determine the appropriate connector to use on the 3Com Ethernet card.Then refer to the appropriate step for installation procedures, as follows:

- **a** For the RJ-45 connector, go to step 2.
- **b** For the AUI connector, go to step 3.
- **c** For the BNC connector, go to step 4.

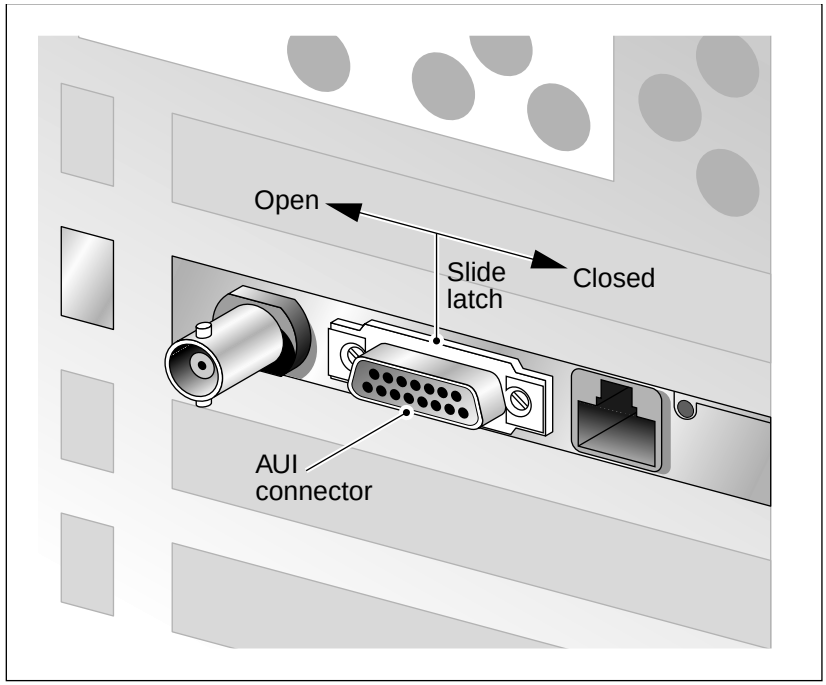
2 Align the RJ-45 plug on the LAN cable with the notch on the RJ-45 connector and insert the plug.

3 Connect AUI cable to the AUI connector as follows:

a Move the slide latch on the 3Com Ethernet card's AUI connector to the open position.

b Plug the AUI cable into the AUI connector. The AUI cable will only fit one way on the AUI connector.

c Move the slide latch on the AUI connector to the closed position to lock the cable in place.

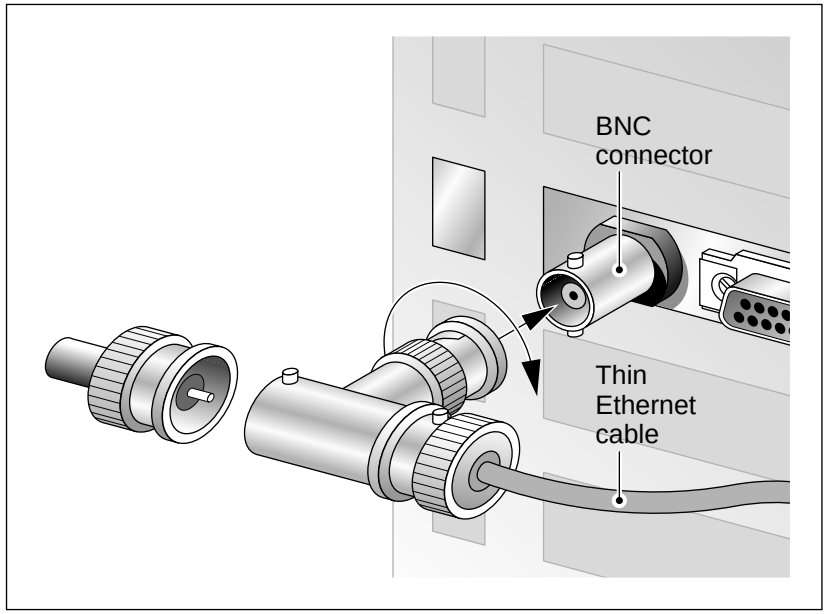


4 Connect the T connector of the customer's LAN cable to the BNC connector on the backplate of the 3Com Ethernet card as follows.

a Align the T connector's slots with the pegs on the BNC connector.

b Push the T connector in and twist it clockwise until it stops.

c If this IVR server is the end point in the LAN (the cable does not continue to another machine), then terminate the LAN cable as shown in the diagram.



5 Plug in the power cord, power up the system, and allow the system to boot up normally.

6 Verify the network configuration information.

a If you are replacing an existing LAN card, see "Replacing a LAN card" on page 17-14.

b If you are adding a second LAN card, see "Adding a second LAN card" on page 17-26. Also refer to the *Planning and Engineering Guide* for LAN card configuration values.

Recommended LAN cable types

The following cable types are recommended:

- For RJ-45 shielded twisted-pair (UTP) connections (100 ohm):
  - Level 3 LAN and high-speed data cable
  - Level 4 extended-distance LAN cable
  - Level 5 data grade media cable
- For AUI thick coax connections:
  - RG59 B/U (50 ohm)
- For BNC thin coax connections:
  - RG58 A/U
  - C/U (50 ohm +/- 4)

Changing cable types

The network driver automatically selects the media type—TP (twisted pair), AUI (thick coaxial), or coax (thin coaxial)—based on the type of cable connection (RJ-45, AUI, or BNC).

If you need to change the cable type, then do the following:

1 Shut down and power off the unit you are working on. (For information on shutting down the system, see “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8.)

2 Change the LAN cable.

3 Power up the system.

When the system powers up, the network driver should detect the new media type.

Note: If the driver cannot detect the type of cable connected or whether a cable is connected, the Auto Select Media Type function defaults to the type of connector stored in the EEPROM (the default is AUI). You can change this default through the 3Com Ethernet card diagnostic utility, which is described in “DOS-based diagnostics and PC Diags” on page 23-35.

Installing the Madge ISA Token Ring card

Madge ISA Token Ring card installation (AP, MRS/AP, or MRS)

The following steps describe how to install a Madge ISA Token Ring card.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and power off the unit you are working on. (For information on shutting down the system, see “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8.)

3 Unplug the power cord for the unit from the electrical outlet.

4 Remove the cover from the unit (see Chapter 21, “Replacing hardware components” for Release 4.0 hardware).

5 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

6 If you are replacing a Madge ISA Token Ring card, identify the slot that contains the faulty card. If you are adding a Madge ISA Token Ring card, select an empty ISA slot for the card.

7 Remove the slot’s retaining screw. If the slot is empty, remove the slot cover. If you are replacing a card in this slot, remove the card.

8 Ensure the switches are set to the following.

Network speed	1	2	3	4
4 Mbps	ON	OFF	OFF	OFF
16 Mbps	ON	OFF	OFF	ON

9 Install the Madge ISA Token Ring card.

Use the slot's card guides as you insert the card edge connector into the slot. Press firmly until the card is securely seated in the slot.

10 Replace and tighten the retaining screw to secure the card.

11 Reinstall the cover for the unit (see Chapter 21, "Replacing hardware components" for Release 4.0 hardware).

12 Connect the customer's LAN cable into the DB9 or RJ-45 connector (cable provided by customer).

13 Reconnect the power cord.

Continue with the steps in "Configuring the Madge ISA Token Ring card" on page 17-11.

Configuring the Madge ISA Token Ring card

1. Insert an MS-DOS 5.0 or higher version system diskette in the floppy drive.
2. Power up the system.
3. At the DOS prompt, type **`c:`** and press <Enter>.
4. Type **`diag`** and press <Enter>.
5. Type **`4`**.

   The Madge Wizard Menu is displayed.
6. Tab to “Change Ringnode configuration” and press <Enter>. The selected item has dashes around the text label.

   Wait for the Hardware Wizard to initialize before continuing.
7. Tab to “Custom” and press <Enter>.

   Wait for the Hardware Wizard to initialize before continuing.
8. Tab to the window that lists the “Global system resources”.
9. Use the arrow keys to select the Smart 16/4 AT Plus Ringnode.
10. Tab to “Select” and press <Enter>.
11. Tab to “Configure” and press <Enter>.

    Wait for the utility to initialize data before continuing.
12. Configure the Madge ISA Token Ring card to the appropriate settings.

    Enter the following values:

    - Use Table 17-2 as a reference for the Interrupt, I/O address, and DMA channel values.
    - Ringspeed = 4 or 16, depending on the hardware settings on the card
    - Memory = Disabled
    - Bus timing = Normal
    - Bus mode = Async
    - Transfer width = 16

Table 17-2: Madge ISA Token Ring card settings

IVR server	Interrupt	I/O Address	DMA channel
Release 2.x AP	10	0x1A20 - 0x1A2F	6
Release 2.x MRS/AP	3 9	0x1A20 - 0x1A2F	6
Note: For MRS/AP, use IRQ 9 if the system does not contain an Antares card. Otherwise, use IRQ 3.			
Release 2.x MRS/Tower or MRS/Rack	9	0x1A20 - 0x1A2F	6
Release 4.0 Tower AP (300tp)	10	0x1A20 - 0x1A2F	6
Release 4.0 MRS/AP (300tp)	10	0x1A20 - 0x1A2F	6
Release 4.0 Tower AP (700tp)	10	0x1A20 - 0x1A2F	6
Release 4.0 MRS/AP (700tp)	10	0x1A20 - 0x1A2F	6
Release 4.0 Rack AP	10	0x1A20 - 0x1A2F	6
Release 4.0 MRS/Tower	10	0x1A20 - 0x1A2F	6
Release 4.0 MRS/Rack	10	0x1A20 - 0x1A2F	6

13 Smartrom and PIO Force should remain unchecked (disabled).

14 Tab to “Program” and press <Enter>.

Wait while the utility updates the configuration.

15 A window is displayed with the following confirmation message:

The operation completed successfully.

16 Tab to “OK” and press <Enter>.

17 Exit out of all windows and exit out of the utility.

18 Type **q** to quit out of the diagnostics menu.

19 Remove the MS-DOS bootup floppy and store in a safe place.

20 Power off the system and then power on.

Allow the system to boot normally.

21 Verify the network configuration information.

a If you are replacing an existing LAN card, see “Replacing a LAN card” on page 17-14.

b If you are adding a second LAN card, see “Adding a second LAN card” on page 17-26. Also refer to the *Planning and Engineering Guide* for LAN card configuration values.

Network configuration

Replacing a LAN card

To replace a LAN card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

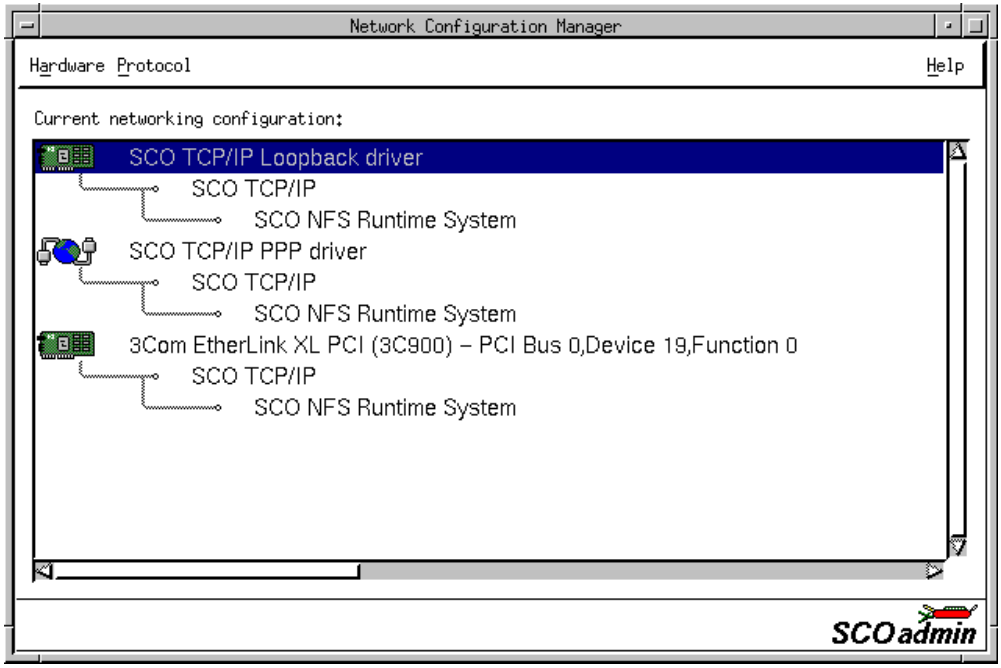
1 Log in as `root` on the AP, MRS/AP, or MRS where the LAN card is being replaced or updated.

2 Do one of the following steps:

   a On an AP or MRS/AP, at the # prompt, type **`netconfig`** and press <Enter>.

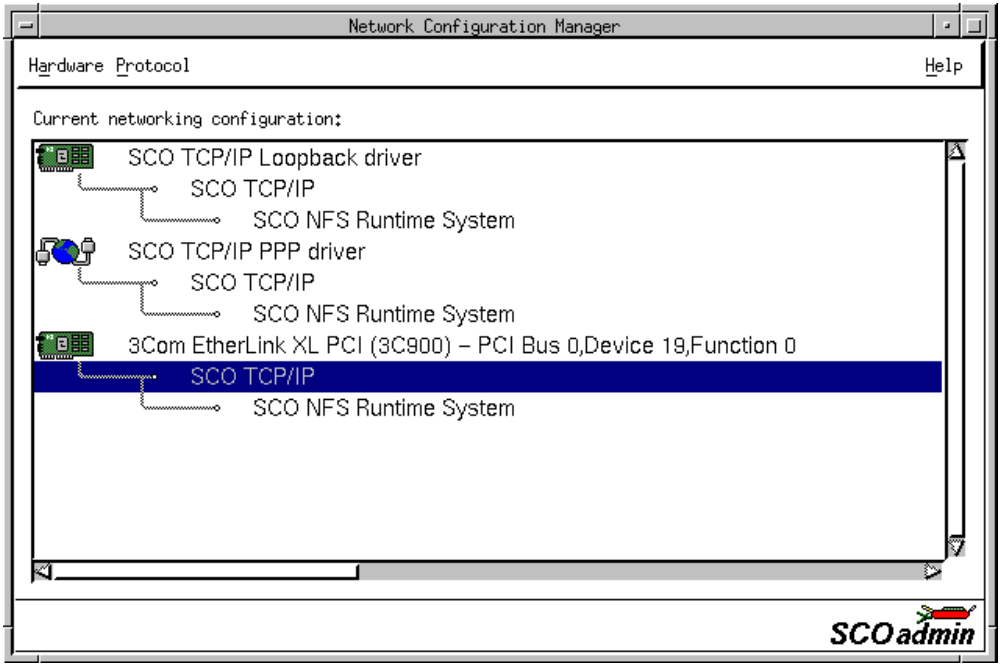
b On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>. At the # prompt, type **`netconfig`** and press <Enter>.

The Network Configuration Manager screen appears. The appearance and style of the screen will vary depending on your terminal type, and whether you access netconfig from the command line interface, or from an xterm window on the IVR desktop. The function of the program remains the same.



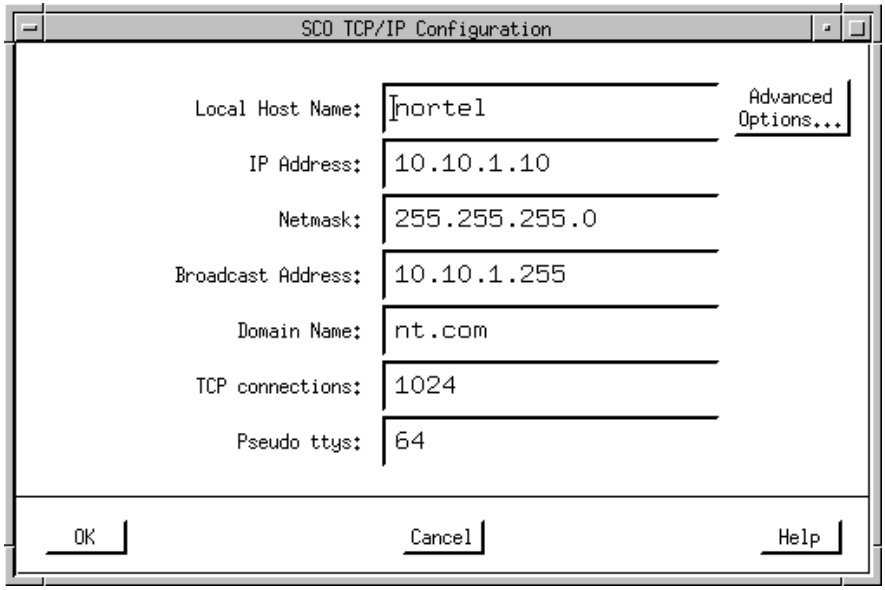
3 Make note of the current LAN card configuration, as listed in the LAN card description. Unless you have a reason to change the LAN card configuration, you should check that the replacement LAN card uses the same values later in this procedure.

4 Select the SCO TCP/IP line from the LAN card description, as shown in the following example.



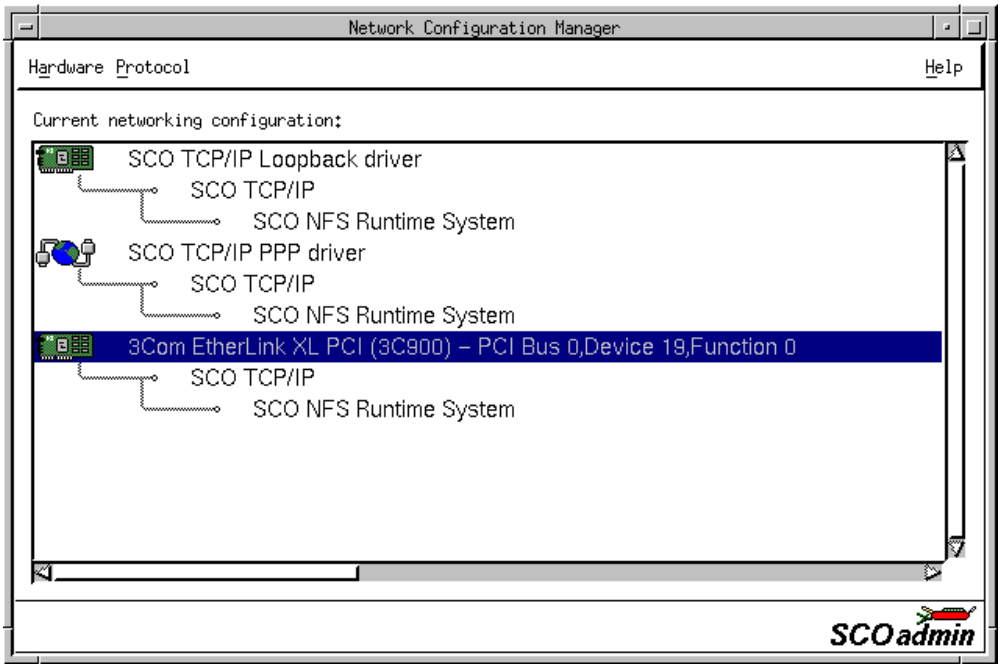
5 From the Protocol menu, select View protocol.

The following screen is displayed:



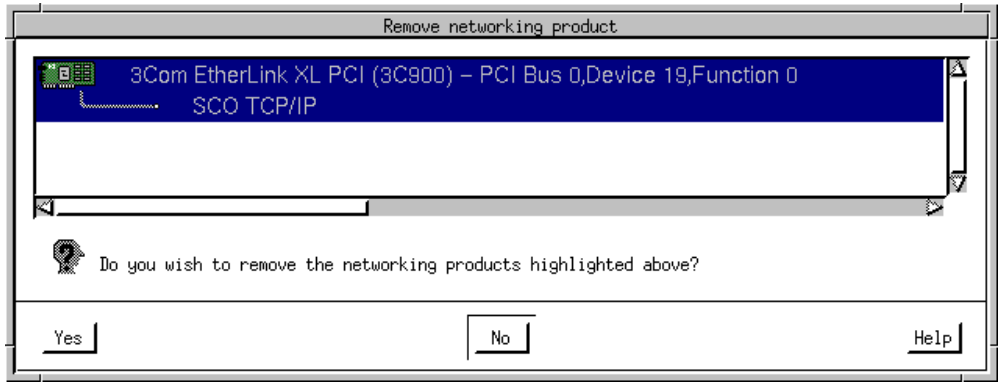
6 Make note of the current configuration, and then select OK. Unless you have a reason to change the TCP/IP configuration, you should check that the replacement LAN card uses the same values later in this procedure.

7 Select the LAN card that you are replacing, as shown in the following example.



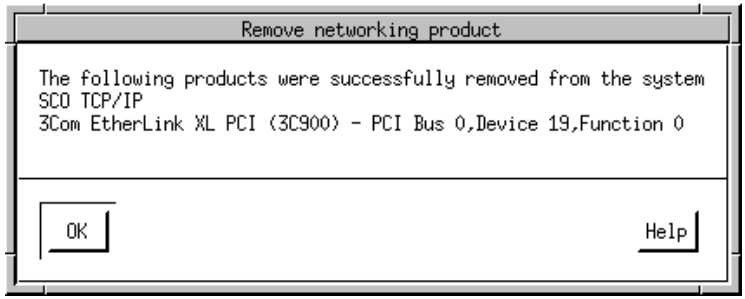
8 From the Hardware menu, select Remove network device.

The following screen is displayed:


Remove networking product
3Com EtherLink XL PCI (3C900) – PCI Bus 0,Device 19,Function 0
SCO TCP/IP
Do you wish to remove the networking products highlighted above?
Yes
No
Help

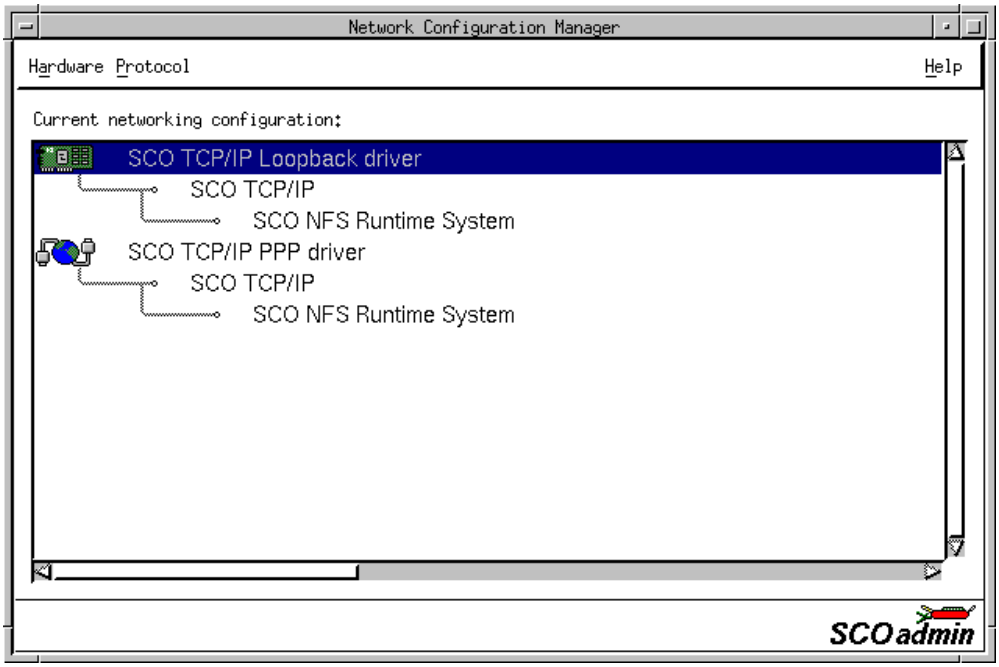
9 Select Yes to remove the LAN card.

The following confirmation message is displayed:


Remove networking product
The following products were successfully removed from the system
SCO TCP/IP
3Com EtherLink XL PCI (3C900) - PCI Bus 0,Device 19,Function 0
OK
Help

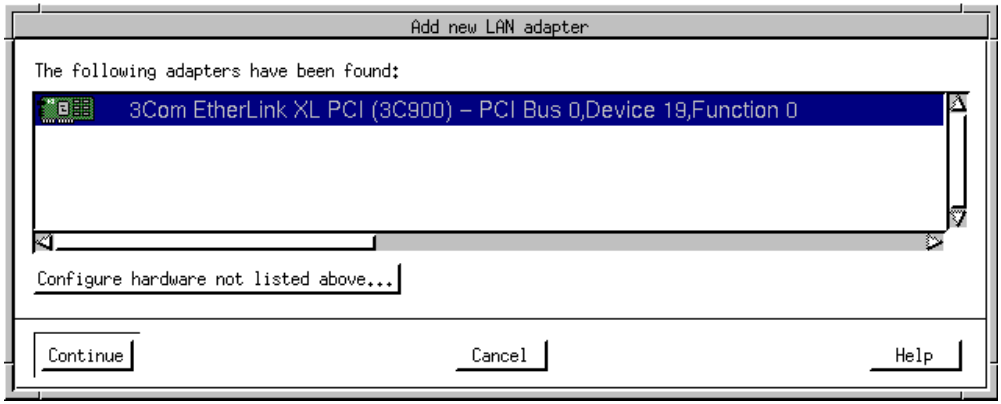
10 Select OK.

The main Network Configuration Manager screen is redisplayed, without the network device that you have just removed.



11 From the Hardware menu, select Add new LAN adapter.

The Add new LAN adapter screen is displayed. The example below is for a 3Com Ethernet card installation.


Add new LAN adapter
The following adapters have been found:
3Com EtherLink XL PCI (3C900) – PCI Bus 0,Device 19,Function 0
Configure hardware not listed above...
Continue
Cancel
Help

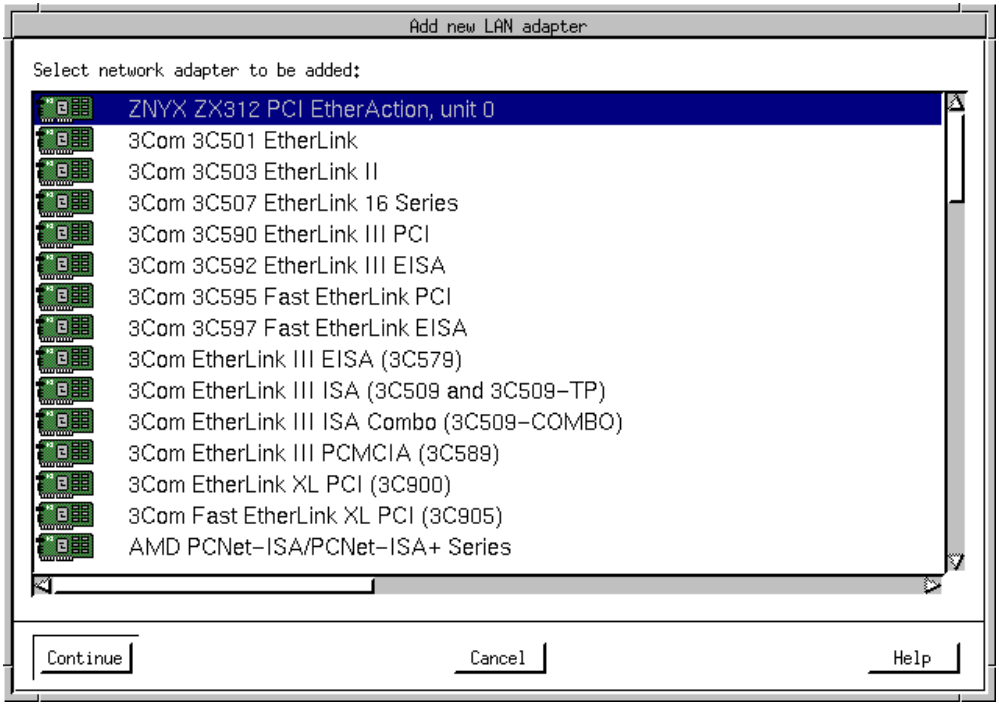
12 Follow substep (a) for a 3Com Ethernet card installation, substep (b) for a ZNYX card installation, or substep (c) for a Madge card installation.

a If a 3Com Ethernet card has been installed, the card and its configuration values are automatically detected, and displayed in the Add new LAN adapter screen.

Select Continue. Then go to step 13.

b If a ZNYX card has been installed, SCO detects the wrong card and displays the wrong card in the Add new LAN adapter screen. Select “Configure hardware not listed above...”.

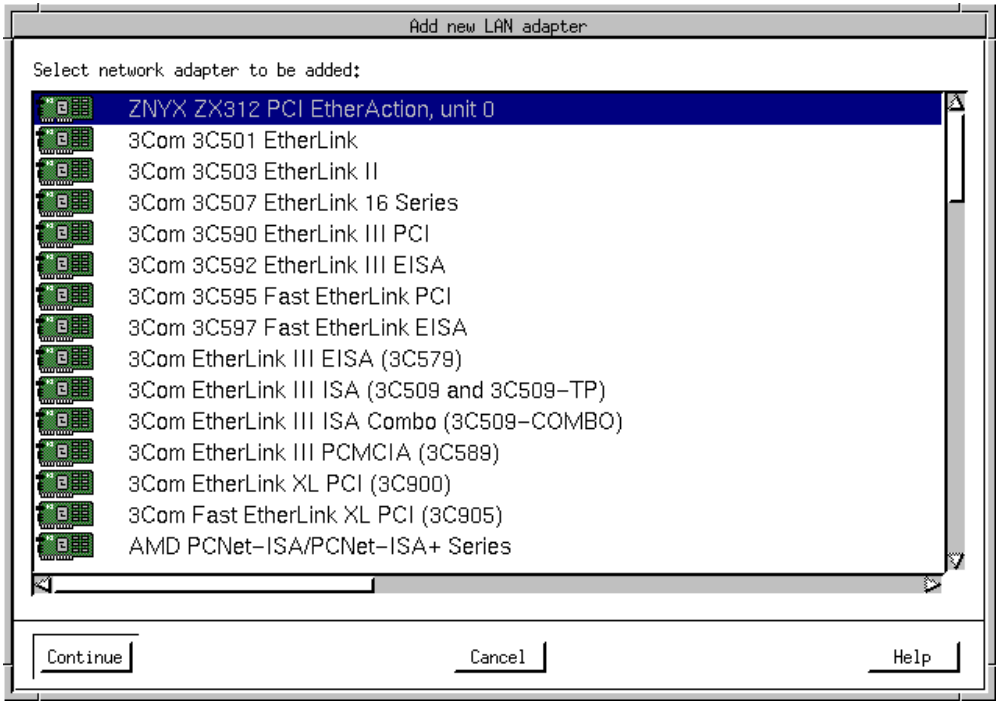
The following screen is displayed.


Add new LAN adapter
Select network adapter to be added:
ZNYX ZX312 PCI EtherAction, unit 0
3Com 3C501 EtherLink
3Com 3C503 EtherLink II
3Com 3C507 EtherLink 16 Series
3Com 3C590 EtherLink III PCI
3Com 3C592 EtherLink III EISA
3Com 3C595 Fast EtherLink PCI
3Com 3C597 Fast EtherLink EISA
3Com EtherLink III EISA (3C579)
3Com EtherLink III ISA (3C509 and 3C509-TP)
3Com EtherLink III ISA Combo (3C509-COMBO)
3Com EtherLink III PCMCIA (3C589)
3Com EtherLink XL PCI (3C900)
3Com Fast EtherLink XL PCI (3C905)
AMD PCNet-ISA/PCNet-ISA+ Series
Continue
Cancel
Help

Highlight the ZNYX card that has been installed and then select Continue. Then configure the card when prompted. For LAN card configuration values, refer to the *Symposium OPEN IVR Planning and Engineering Guide*.

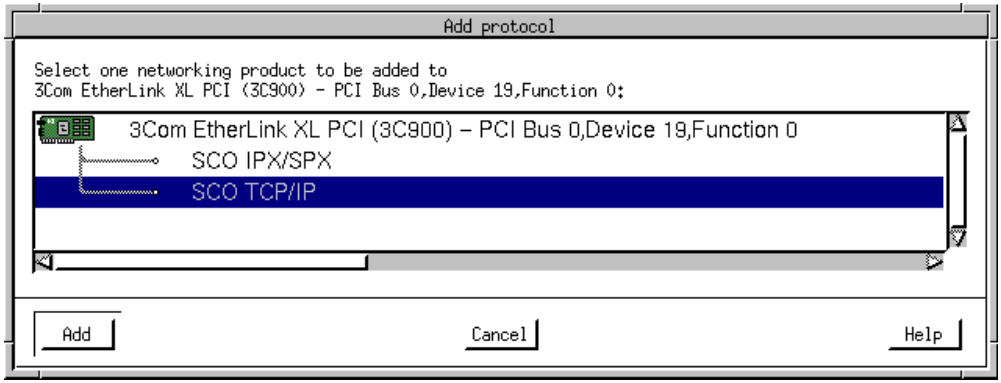
When the card is configured, go to step 13.

c If a Madge Token Ring card has been installed, you are asked to choose the card type from a list of LAN cards, as shown in the following screen.


Add new LAN adapter
Select network adapter to be added:
ZNYX ZX312 PCI EtherAction, unit 0
3Com 3C501 EtherLink
3Com 3C503 EtherLink II
3Com 3C507 EtherLink 16 Series
3Com 3C590 EtherLink III PCI
3Com 3C592 EtherLink III EISA
3Com 3C595 Fast EtherLink PCI
3Com 3C597 Fast EtherLink EISA
3Com EtherLink III EISA (3C579)
3Com EtherLink III ISA (3C509 and 3C509-TP)
3Com EtherLink III ISA Combo (3C509-COMBO)
3Com EtherLink III PCMCIA (3C589)
3Com EtherLink XL PCI (3C900)
3Com Fast EtherLink XL PCI (3C905)
AMD PCNet-ISA/PCNet-ISA+ Series
Continue
Cancel
Help

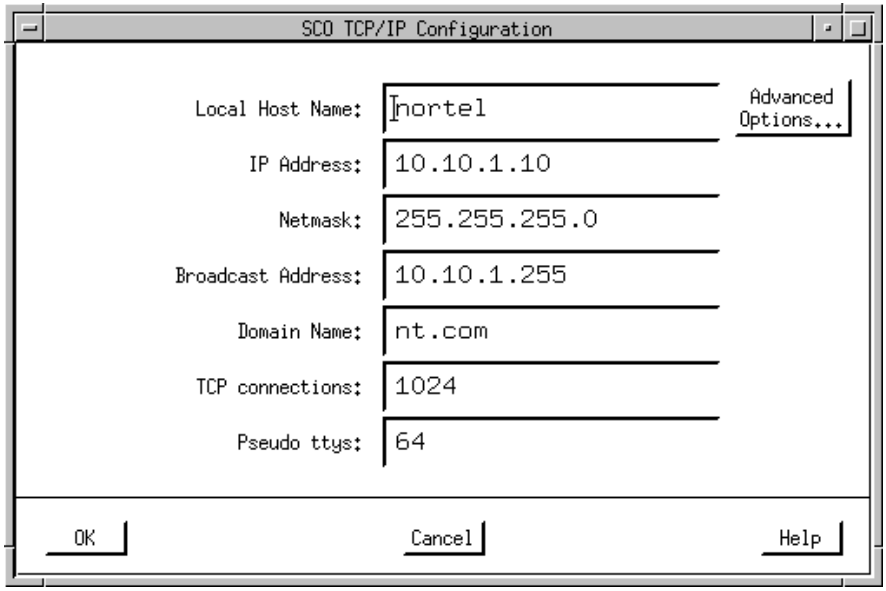
Highlight the Madge card that has been installed and then select Continue. Then go to step 13.

13 Select the SCO TCP/IP option, as shown in the following example:


Add protocol
Select one networking product to be added to
3Com EtherLink XL PCI (3C900) - PCI Bus 0,Device 19,Function 0:
3Com EtherLink XL PCI (3C900) - PCI Bus 0,Device 19,Function 0
SCO IPX/SPX
SCO TCP/IP
Add
Cancel
Help

14 Select Add.

The existing TCP/IP configuration is displayed:

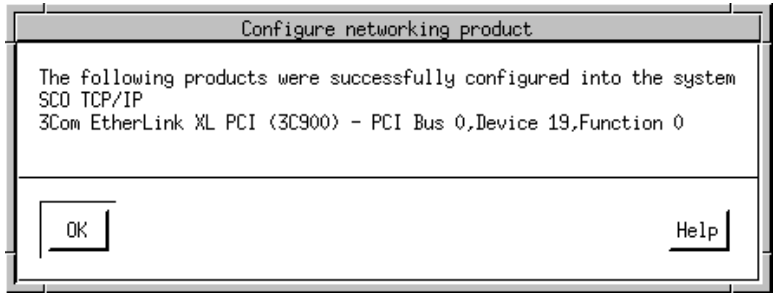


If you are not intending to change the network configuration of the card you are replacing, then do not make any changes.

Note: Do not modify the TCP connections and Pseudo ttys values.

15 Select OK.

The following confirmation screen is displayed:

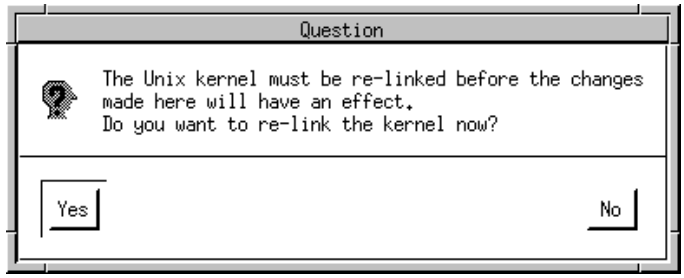

Configure networking product
The following products were successfully configured into the system
SCO TCP/IP
3Com EtherLink XL PCI (3C900) - PCI Bus 0,Device 19,Function 0
OK
Help

16 Select OK to confirm.

The main Network Configuration Manager screen is displayed.

17 If you are finished using the Network Configuration Manager, select Exit from the Hardware menu.

The following screen is displayed:


Question
The Unix kernel must be re-linked before the changes made here will have an effect.
Do you want to re-link the kernel now?
Yes
No

18 Select Yes to relink the kernel. If you have been in windows-mode, the system puts you into a command-line mode for the kernel relink prompts.

After the kernel is rebuilt, the following prompt is displayed:

```
Do you want this kernel to boot by default? (y/n)
```

19 Type **y** and press <Enter>.

The following prompt is displayed:

```
Do you want the kernel environment rebuilt? (y/n)
```

20 Type **y** and press <Enter>.

The kernel is relinked, and the following is displayed:

```
The kernel has been successfully linked and
installed.
To activate it, reboot your system.

Setting up new kernel environment
Press Enter to continue
```

21 Press <Enter> to continue.

22 A host name change on the netconfig screens does not take effect after reboot. To change the host name, enter the following command before rebooting (this command is entered at the root prompt):

uname -S *newname*

23 If you made changes to the IP address or host name for the LAN card, ensure that the hosts and rhosts files are updated on all IVR servers in the LAN. See “Updating the hosts and rhosts files on an MRS” on page 13-15, and “Updating the hosts and rhosts files on an AP or MRS/AP” on page 13-16.

24 Restart the system for the changes to take effect, using one of the following two commands:

a On an AP or MRS/AP, type **`shutdown -y -g0`** and press <Enter>. (See “Shutting down the AP or MRS/AP” on page 2-7 for more information.)

b On an MRS, use the **`/sci/maint/restart`** option.

25 Verify the LAN connection as described in Chapter 23, “Troubleshooting.”

Adding a second LAN card

To add a second LAN card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

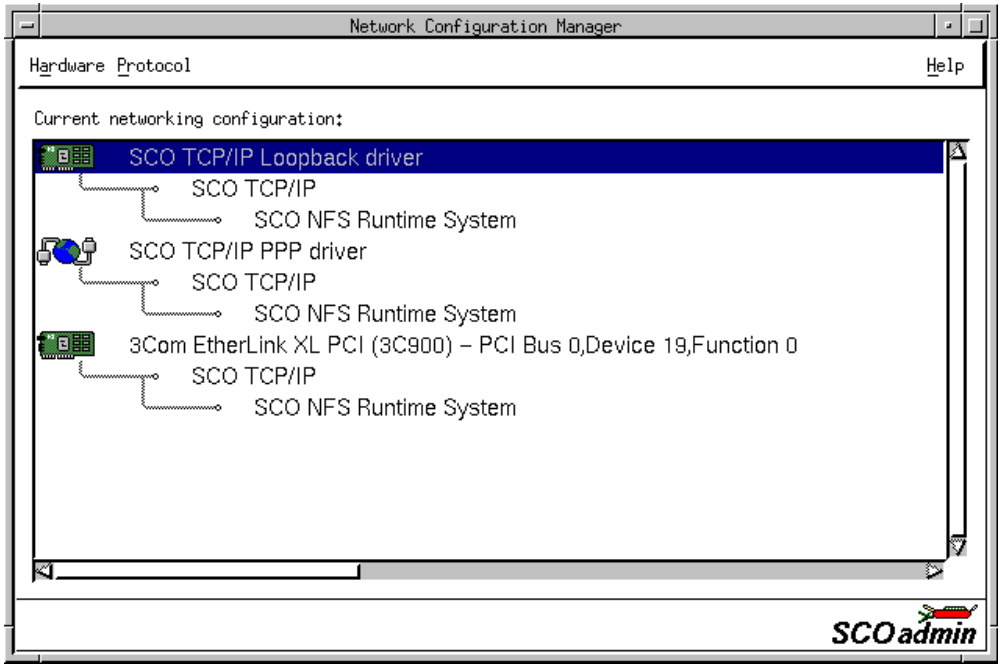
Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Log in as `root` on the AP, MRS/AP, or MRS where the LAN card is being added.

2 At the # prompt, type **`netconfig`** and press <Enter>.

The Network Configuration Manager screen appears. The appearance and style of the screen will vary depending on your terminal type, and whether you access netconfig from the command line interface, or from a Shell window on the IVR desktop. The function of the program remains the same.



3 Follow step 7 to step 25 in the procedure in “Replacing a LAN card” on page 17-14.

Modifying the IP address or host name

If you need to make changes to the IP address or host name for the LAN card, then the hosts files also need to be updated. Follow the instructions in Chapter 13, “Changing the LAN IP address or host name.”

Chapter 18: SBC card and SIMMs installation

Overview

This chapter describes how to replace and upgrade the Single Board Computer (SBC) card. This chapter is divided into the following sections:

- "Section A: Tower AP (300tp), and MRS/AP (300tp)" on page 18-2
- "Section B: Tower AP (700tp), MRS/AP (700tp), MRS/Tower, MRS/Rack, Rack AP" on page 18-10

Release 2.x hardware platforms

For instructions on replacing or maintaining the CPU card in Release 2.x hardware platforms, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

Section A: Tower AP (300tp), and MRS/AP (300tp)

Overview

The procedures in this section can be used for the Tower AP (300tp) and MRS/AP (300tp). The procedures included in this section are:

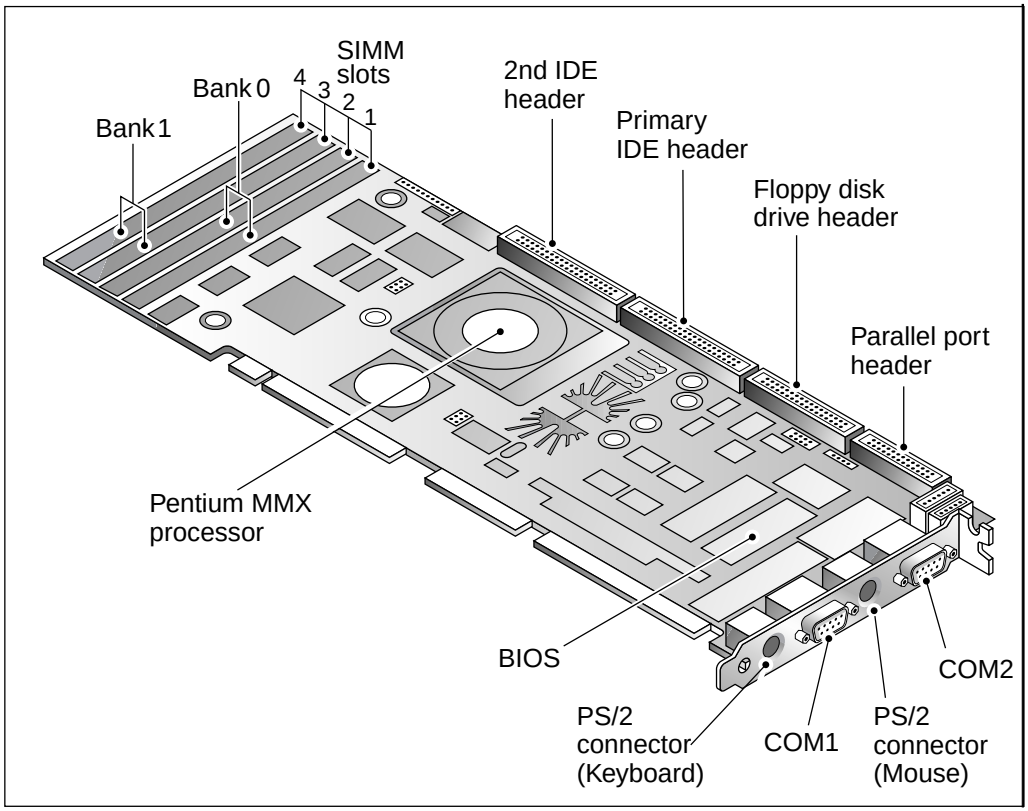
- replacing the SBC card
- configuring the BIOS
- adding memory SIMMs to the SBC

SBC card description

The Peak 530 SBC card is used in the Tower AP (300tp) and MRS/AP (300tp).

Figure 18-1 shows the SBC card and its cable connectors and SIMM slots.

Figure 18-1: The SBC card



Replacing the SBC card

Requirements

- one Phillips-head screwdriver
- one antistatic wrist strap
- the replacement SBC card

Procedure for replacing the SBC card

To replace the SBC card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Power down the system and disconnect all power cords. (For information on shutting down the system, see “Shutting down the AP or MRS/AP” on page 2-7.)

3 Remove the side cover.

4 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

5 Remove the expansion card stabilization bar.

6 Label all connectors to the SBC card.

7 Free all connectors from the installed SBC card.

8 Loosen and remove the screw located at the top of the card's faceplate.

9 Loosen the installed card and pull it up from the backplane.

Note: You can now do the following:

- Replace it with a new card. To replace, continue with step 10.
- Upgrade it by adding SIMM(s) to the card. To upgrade refer to "Procedure for adding SIMMs to the SBC card" on page 18-8.

10 Remove the replacement card from its protective wrapping.

11 Align the SBC card with its slot on the backplane and press it into place.

12 Tighten the screw located at the top of the card's faceplate, securing it into position.

13 Remove the labels attached to all connectors and reconnect them to the SBC card.

14 Replace the expansion card stabilization bar.

15 Replace the side cover.

Configuring the BIOS

Overview

The Basic Input Output System (BIOS) of the computer is Flash ROM based code. The system is equipped with Flash BIOS which enables you to upgrade the BIOS by running a single program that writes updated code to the Flash ROM chips.

When to configure the BIOS

Reconfigure the BIOS if you:

- replace the lithium battery on the SBC
- replace the SBC card

Reference

See the *Planning and Engineering Guide* for details regarding the BIOS.

Procedure for configuring the BIOS

To configure the BIOS on the Tower AP and MRS/AP, follow these steps.

1 Power on the system and press DEL to enter the CMOS Setup.

Note: For the following steps, use the arrow keys to navigate menus and press <Enter> to make a selection.

2 Highlight the option `Load BIOS defaults` and press <Enter>.

3 To configure the BIOS, type **y** and press <Enter>.

4 Ensure that the BIOS settings are the same as shown in the *Symposium OPEN IVR Planning and Engineering Guide*.

Note: Use the arrow key to move to a value and select it. Use the Page Up/Page Down keys to change a value. Press <Enter> to make a change.

5 Highlight the menu entry `Save & Exit Setup` and press <Enter>.

6 Type **y** and press <Enter> to confirm the changes and reboot.

Adding Single Inline Memory Modules to the SBC

SIMM description

Single In-line Memory Modules (SIMM) are located on the SBC. They are also referred to as volatile memory. As with the gold-plated edge connectors on expansion cards, those on SIMMs are designed to plug into matching edge-connector slots. The design allows you to add or remove these modules repeatedly without tools or damage.

Supported SIMM specifications and capacity

Symposium OPEN IVR supports the following SIMM specifications and capacity:

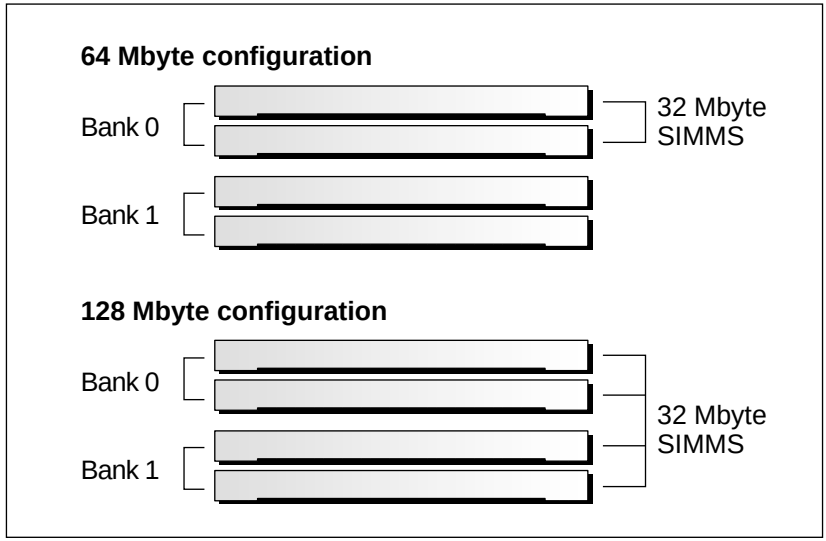
- Standard 72-pin Fast Page Mode (FPM) parity DRAM utilizing SIMM technology with 60-70 ns access times
- 32 Mbyte SIMMs
- a minimum of 64 Mbyte and a maximum of 128 Mbyte of memory per server (AP, MRS, or MRS/AP); new systems are shipped with 64 Mbyte RAM (two 32 Mbyte SIMMs in bank 0)

Rules for adding SIMMs

There are two SIMM banks on the SBC. Bank 0 consists of slot 1 and 2, and bank 1 consists of slot 3 and 4.

- A bank must be completely filled to be operable.
- Each slot in a bank must contain identical SIMMs. This means that if a 32 Mbyte SIMM is installed in slot 1, another 32 Mbyte SIMM must be installed in slot 2. See Figure 18-2 for possible memory configurations.

Figure 18-2: DRAM configurations



Requirements

To add SIMMs to the card, you require the following:

- antistatic wrist strap
- SIMMs with gold-plated pads to be added

Procedure for adding SIMMs to the SBC card

To add memory SIMMs to the SBC card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

2 Remove the SBC from the chassis. See “Procedure for replacing the SBC card” on page 18-4.

Note: To remove SIMMs perform steps 3 and 4. To add SIMMs, go to step 5.

3 Push the SIMM release tab at both sides of the SIMM to be removed outwards. Always remove in the following order: 4, 3, 2 and 1.

4 Remove the SIMM.

5 Align the SIMM with the slot in which it is to be inserted.

Note: The “keyed” end of the SIMM must be toward the edge of the SBC. Each SIMM slot is numbered. Install SIMMs in the following order: Slots 1, 2, 3 and 4.

6 Hold at a 45° angle to the slot and push the bottom edge evenly and firmly into the slot.

7 Rotate the SIMM to position it at a 90° angle to the SBC card. The tabs at both ends must click into place.

8 Verify that the SIMM is seated correctly by rocking it gently back and forth. Inspect it visually. If the SIMM lifts up it is not seated correctly.

9 Reinstall the SBC card in the chassis.

Section B: Tower AP (700tp), MRS/AP (700tp), MRS/Tower, MRS/Rack, Rack AP

Overview

The procedures in this section can be used for the Tower AP (700tp), MRS/AP (700tp), MRS/Tower, MRS/Rack, or Rack AP. The procedures included in this section are:

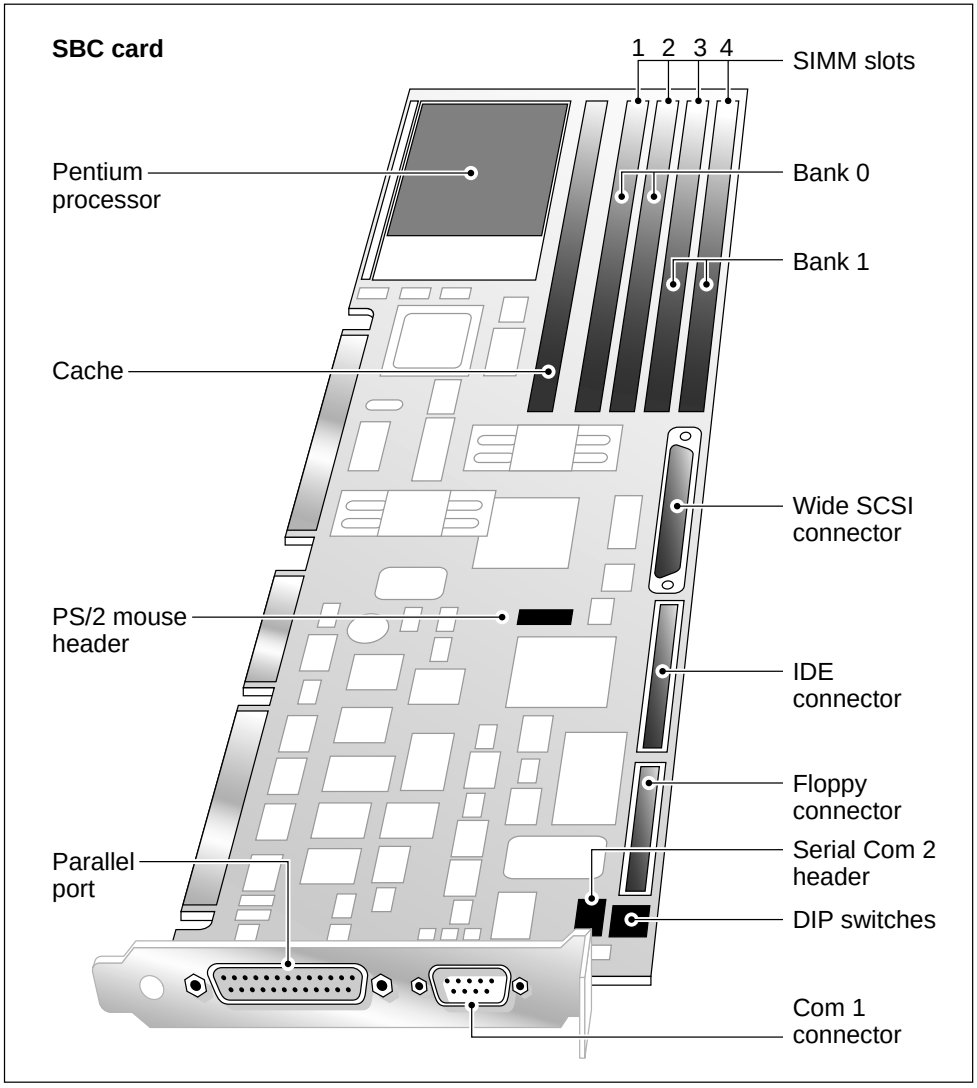
- replacing the SBC card
- configuring the BIOS
- adding memory SIMMs to the SBC

SBC card description

The P5000HX2(-M) is used in the Tower AP (700tp) and MRS/AP (700tp), MRS/Tower, MRS/Rack, and Rack AP.

Figure 18-3 shows the SBC card and its cable connectors and SIMMs slots.

Figure 18-3: The SBC card



Replacing the SBC card

Requirements

- one Phillips-head screwdriver
- one antistatic wrist strap
- the replacement SBC card

Procedure for replacing the SBC card

To replace the SBC card, follow these steps.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Power down the unit that is having its SBC card replaced. (For information on shutting down the system, see “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8.)

3 Disconnect the power cord.

4 If this is an MRS/Tower, place the MRS/Tower on its side so that the drive tray is at the bottom.

5 Remove the top cover.

6 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

7 On an MRS/Tower, remove the card retaining bar.

8 Label all connectors to the SBC card.

9 Free all connectors from the installed SBC card.

10 Loosen and remove the screw located at the top of the card's faceplate.

11 Loosen the SBC card and pull it up from the backplane.

Note: At this point, the card can be

- replaced by a new SBC card. To replace, continue with step 12.
- upgraded by adding SIMM(s) to the card. To upgrade refer to "Adding Single Inline Memory Modules to the SBC" on page 18-15.

12 Remove the replacement card from its protective wrapping.

13 Align the SBC card with its slot on the backplane and press it into place.

The SBC card should be seated properly in both the ISA-style and PCI-style connectors.

14 Fasten the card down using the screw provided.

15 Remove the labels attached to all connectors and reconnect them to the SBC card.

16 If the system is an MRS/Tower, replace the card retaining bar.

17 Replace the top cover.

18 If the system is an MRS/Tower, reposition the MRS/Tower in its normal upright position.

Configuring the BIOS

Overview

The Basic Input Output System (BIOS) of the computer is Flash ROM-based code. The system is equipped with Flash BIOS which enables you to upgrade the BIOS by running a single program that writes updated code to the Flash ROM chips.

When to configure the BIOS

Reconfigure the BIOS if you

- replace the lithium battery on the SBC
- replace the SBC card

Reference

See the *Planning and Engineering Guide* for details regarding the BIOS.

Procedure for configuring the BIOS

To configure the BIOS, follow these steps:

1 Power on the system and press F2 to enter the CMOS Setup.

Note: For the following steps, use the arrow keys to navigate menus and press <Enter> to make a selection.

2 Select Advanced Options.

3 Select Redirection and check that it is disabled.

4 Select PS2 Mouse and check that it is enabled.

5 Select PCI Options.

6 Select IRQ 11 for all PCI slots.

7 Select Onboard SCSI.

8 Enable SCSI.

9 Press <Esc> twice to exit.

10 For the complete list of BIOS settings, refer to the *Symposium OPEN IVR Planning and Engineering Guide*.

Adding Single Inline Memory Modules to the SBC

SIMM description

Single In-line Memory Modules (SIMM) are located on the SBC. They are also referred to as volatile memory. As with the gold-plated edge connectors on expansion cards, those on SIMMs are designed to plug into matching edge-connector slots. The design allows you to add or remove these modules repeatedly without tools or damage.

Supported SIMM specifications and capacity

Symposium OPEN IVR supports the following SIMM specifications and capacity:

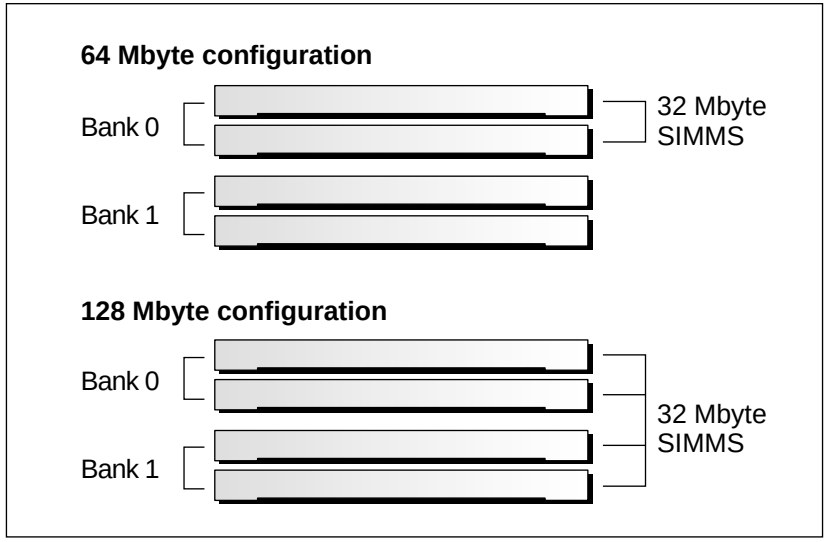
- standard 72-pin Fast Page Mode (FPM) parity DRAM utilizing SIMM technology with 60-70 ns access times
- 32 Mbyte SIMMs
- a minimum of 64 Mbyte and a maximum of 128 Mbyte of memory per server (AP, MRS, or MRS/AP); new systems are shipped with 64 Mbyte RAM (two 32 Mbyte SIMMs in bank 0)

Rules for adding SIMMs

There are two SIMM banks on the SBC. Bank 0 consists of slots 1 and 2, and bank 1 consists of slots 3 and 4.

- A bank must be completely filled to be operable.
- Each slot in a bank must contain identical SIMMs. This means that if a 32 Mbyte SIMM is installed in slot 1, another 32 Mbyte SIMM must be installed in slot 2. See Figure 18-4 on page 18-16 for possible memory configurations.

Figure 18-4: DRAM configurations



Requirements

To add SIMMs to the card, you require the following:

- antistatic wrist strap
- SIMMs with gold-plated pads to be added

Procedure for adding SIMMs to the SBC card

To add memory SIMMs to the SBC card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.
2. Remove the SBC from the chassis. See “Procedure for replacing the SBC card” on page 18-12.

   Note: To remove SIMMs, perform steps 3 and 4. To add SIMMs, go to step 5.

3. Push the SIMM release tab at both sides of the SIMM to be removed outwards. Always remove in the following order: 4, 3, 2, and 1.
4. Remove the SIMM.
5. Align the SIMM with the slot in which it is to be inserted.

   Note: The “keyed” end of the SIMM must be toward the edge of the SBC. Each SIMM slot is numbered. Install SIMMs in the following order: Slots 1, 2, 3, and 4.

6. Hold at a 45° angle to the slot and push the bottom edge evenly and firmly into the slot.
7. Rotate the SIMM to position it at a 90° angle to the SBC card. The tabs at both ends must click into place.

8 Verify that the SIMM is seated correctly by rocking it gently back and forth. Inspect it visually. If the SIMM lifts up, it is not seated correctly.

9 Reinstall the SBC card in the chassis.

Chapter 19: Telco interface card installation

Overview

This chapter includes the following topics:

- "Release 2.x hardware platforms" on page 19-2
- "Dial Pulse Detection feature" on page 19-2
- "SCbus cabling rules" on page 19-2
- "Slot assignment rules" on page 19-2
- "4-port loopstart interface (D/41ESC)" on page 19-3
- "16-port loopstart interface (D/160SC-LS)" on page 19-11
- "T1 interface card (D/240SC-T1)" on page 19-18

Note: For option cards installation, refer to the appropriate option guide.

Release 2.x hardware platforms

For instructions on replacing or adding telco cards in Release 2.x hardware platforms, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*. If replacing an existing telco card in the same slot, card activation is not required.

> ***Note:*** Ensure that the hardware settings on the replacement card are the same as on the card you are replacing.

To activate a D/41ESC or D/240SC-T1 card that has been added to a Release 2.x hardware platform, refer to the Card Activation procedures in this chapter.

To activate a telco card other than the D/41ESC or D/240SC-T1, refer to the `/sci/setup/trkbrd` and `/sci/config/trunk` options in the *Symposium OPEN IVR Service Console Interface Reference Manual*. For card settings, refer to the *Symposium OPEN IVR Planning and Engineering Guide.*

Dial Pulse Detection feature

If you are installing the Dial Pulse Detection feature, the telco card must be of a specified type, as described in Chapter 20, "Dial Pulse Detection option."

SCbus cabling rules

Refer to the *Symposium OPEN IVR Planning and Engineering Guide* for SCbus cabling rules.

Slot assignment rules

Refer to the *Symposium OPEN IVR Planning and Engineering Guide* for slot assignment rules.

4-port loopstart interface (D/41ESC)

Description

The four-channel loopstart card for Symposium OPEN IVR is the D/41ESC. Up to four analog telephone channels are supported by each card. Four RJ11 jacks are accessible from the card's faceplate, which allows attachment to the telephone network.

The D/41ESC card includes the voice processing resources and the loopstart network interface resources.

Limitations

Different types of telco cards cannot be installed in the same MRS or MRS/AP.

Switch settings

Board locator switch (SW1 plus switch 2 of SW2)

Switch SW1 plus switch 2 of SW2 combine to form the unique board locator ID. Do not set two cards to the same number. Follow steps 1 and 2.

1. Dial the rotary switch (SW1) to select a number. Set the first card to 0, the second to 1, and so on. The switch has hexadecimal numbers ranging from 0 to F inclusive.
2. Set SW2 switch 2 to OFF.

Default line state (Switch 1 of SW2)

Switch 1 of SW2 sets the card's default response to an incoming call when the system is down. Choose one of the following two options for each D/41ESC card:

1. Set switch 1 of SW2 to OFF for a line state of "on-hook," which produces a ringing, no answer response when the system is down.
2. Set switch 1 of SW2 to ON for a line state of "off-hook," which produces a busy signal when the system is down.

It is not necessary to set all of the cards in the system to the same default line state.

Memory range

The default memory range for all D/41ESC cards in the system is D0000-D1FFF. All D//41ESC cards can share the same memory range.

Figure 19-1: D/41ESC loopstart interface card

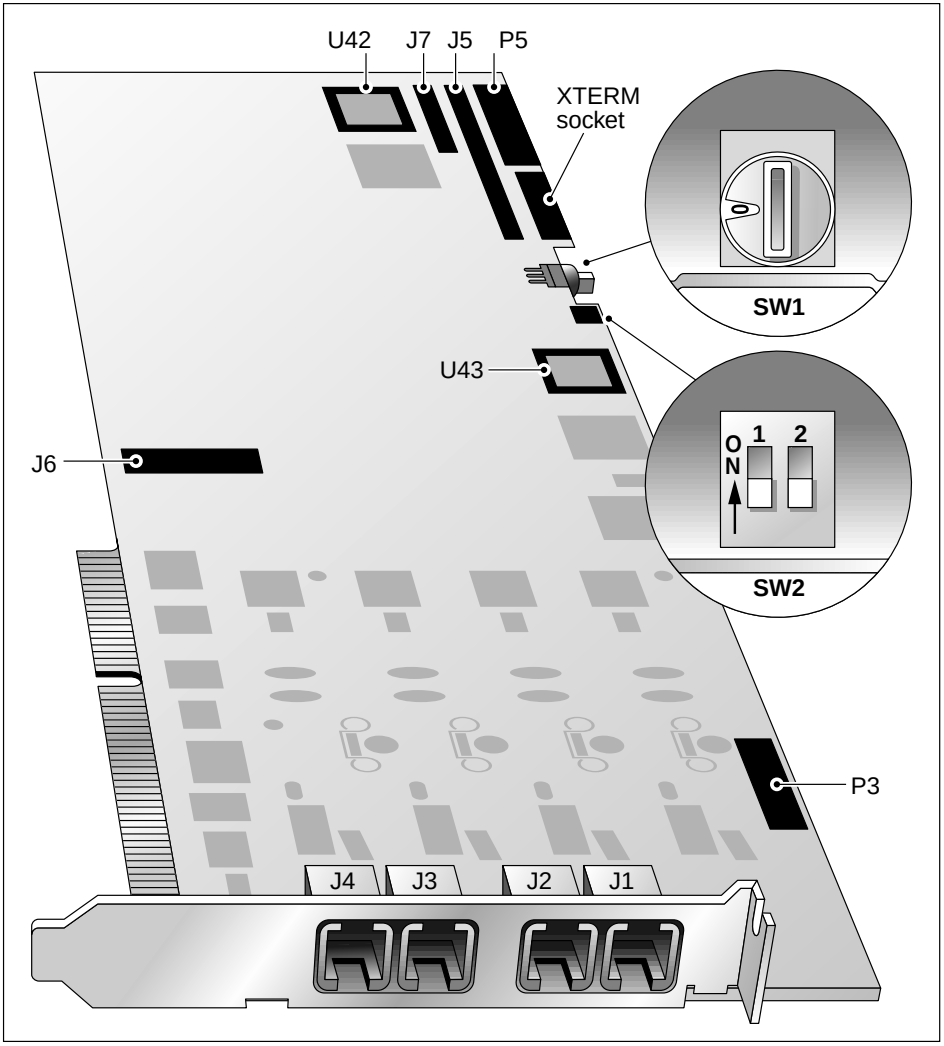


Table 19-1: D/41ESC board locator switch settings

Card #	Ports	SW1	SW2-2
1	00–03	0	OFF
2	04–07	1	OFF
3	08–11	2	OFF
4	12–15	3	OFF
5	16–19	4	OFF
6	20–23	5	OFF
7	24–27	6	OFF
8	28–31	7	OFF
9	32–35	8	OFF
10	36–39	9	OFF
11	40–43	A	OFF
12	44–47	B	OFF
13	48–51	C	OFF
14	52–55	D	OFF
15	56–59	E	OFF
16	60–63	F	OFF

Installing the card

To install the card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and power off the system. (See “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8 for more information.)

3 Unplug all power cords for the system from electrical outlets.

4 Remove the cover from the chassis (see Chapter 21, “Replacing hardware components”).

5 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

6 Set the switch settings on the card (see “Switch settings” on page 19-3).

7 Select an available slot for this card (refer to the *Symposium OPEN IVR Planning and Engineering Guide*).

Note: It is easiest to fill the available slots from left to right.

8 Remove the slot’s retaining screw. If the slot is empty, remove the slot cover. If you are replacing a card in this slot, remove the existing card.

9 Use the slot's card guides as you insert the card edge connector into the slot. Press firmly until the card is securely seated in the slot.

10 Replace and tighten the retaining screw to secure the card.

11 Connect the SCbus cable to the P5 connector on the card and ensure that a PEB terminator is not installed. See Figure 19-1 on page 19-4 for the location of the P5 connector.

12 Repeat steps 6 to 11 for each additional D/41ESC card you are installing.

13 Replace the chassis cover.

14 Connect RJ11 cables from the RJ11 jacks on the backplate of the D/41ESC card to the public switch telephone network or to the local PBX, depending on the setup of the system.

15 Plug in power cords, power up the system, and allow the system to boot up normally.

16 Activate the card (see "Activating the D/41ESC card" on page 19-8).

17 Run the card diagnostics to ensure the card is functioning properly (see "D/41ESC or D/160SC-LS card" on page 23-36).

Activating the D/41ESC card

When theD/41ESC card is installed, activate the option using the `/sci/setup` menu as follows.

1 Log in to the MRS or MRS/AP as `service`.

2 Type **`setup`** and press <Enter>.

3 At the `/sci/setup` prompt, type **`trkbrd`** and press <Enter>.

The SCI displays this prompt:

```
Please enter the trunk group number to edit =
```

Each trunk group consists of four voice channels. Therefore, if you are configuring the four channels of the first D/41ESC card, you would specify group number 1. If you are configuring two D/41ESC cards, you would specify group numbers 1 through 2.

4 Type the trunk group range and press <Enter>.

The SCI confirms whether the trunk range has already been activated:

```
Current Trunk Group Does Not Exist - Add it? =
cancel
add      - Add a new entry.
cancel   - Do not add the new entry.
        Trunk Group Does Not Exist - Add it? =
```

5 Type **`add`** and press <Enter> to activate the new range of trunks.

The system displays a screen similar to the following:

```
Current Board Type = d160sc-ls
acl30 - Aculab 30 port E1/ISDN Network Card.
acl60 - Aculab 60 port E1/ISDN Network Card.
aclbri - Aculab BRI ISDN with D/240SC Span Card.
d160sc-ls - A D/160SC-LS 16 channel Loopstart Card.
d240sc-t1 - A D/240SC-T1 high density T1 Span Card.
d240sc-t1gc - 23 port PRI ISDN with D/240SC-T1 Span Card
d300sc-e1gc - 30 port PRI ISDN with D/300SC-E1 Span Card
dti301sc-elg - 30 port CAS with DTI/301SC and D/320SC
Span Cards
d4xe - A D4xE Interface & Springboard.
default - A D/160SC-LS 16 channel Loopstart Card.
             Board Type =
```

6 Type the board type (**d4xe**) and press <Enter>.

The system displays:

```
Default Board Base RAM Address in hex = 0xD0000
Board Base RAM Address in hex =
```

7 Press <Enter> to select the default Board Base RAM address.

The system displays:

```
Default Board Locator address in hex = 0x0
Board Locator address in hex =
```

Note: The Board Locator address 0x0 represents the first telco card. The address for additional cards will be 0x1, 0x2, etc.

8 Press <Enter> to select the default Board Locator address.

The system displays:

```
Current Type of data encoding to use? = mu-law
mu-law - Default data encoding used in the US.
a-law - Default data encoding used in Europe.
Type of data encoding to use? =
```

9 Type **mu-law** or **a-law**, depending on the region, and press <Enter>**.**

Note: On a PEB-based system, the response must be **a-law** for all regions.

The system displays:

```
Current Type of clocking to use? = slave
slave       - Extract clock from the line
resource    - Allow resource boards to control
clocking
master      - Use the internal clock
default     - Extract clock from the line
        Type of clocking to use? =
```

10 Configure the first D/41ESC card in the system as master. Configure any additional D/41ESC cards as resource. Make your selection and press <Enter>.

The system displays:

```
Current Global Dial Pulse Detection = disabled
enabled    - GDPD is enabled
```

```
disabled    - GDPD is disabled
        Global Dial Pulse Detection =
```

11 Type **disabled**, unless this card is being installed for the DPD feature, and press <Enter>.

The system displays:

```
Parameter File selection menu
1  -  Select from installed
2  -  Select custom
3  -  Do not use any parameter file(s)
Enter your choice [3] :
```

12 Type **1** and press <Enter>.

```
Current Parameter File = 0
0   - GEN_41E.prm  D/41E-SC LS Generic Parameter file
1   - US_41E.prm   D/41E-SC LS Parameter file for U.S
        Parameter File =
```

13 Type **0** and press <Enter>.

14 Repeat the steps in this procedure to activate all the available trunks.

15 At the /sci/setup> prompt, type **hwsetup** and press <Enter> to check that the card is configured.

16 At the /sci/setup> prompt, type **done** and press <Enter>.

17 To change the default trunk type, use the /sci/config/trunk option. See the *Service Console Interface Reference Manual* for instructions.

18 The installation and activation of the D/41ESC card is complete. Proceed to the section “Restarting the system” on page 19-25.

16-port loopstart interface (D/160SC-LS)

Description

The D/160SC-LS is a combined loopstart interface and voice processing card with 16 on-board channels. This card is supported on SCbus systems only, and only in North America.

Limitations

Different types of telco cards cannot be installed in the same MRS or MRS/AP.

Switch settings

Board locator switch (SW100)

Switch SW100 is used to assign the unique board locator ID. Do not set two cards to the same number. Perform the following step for installation:

- Dial the rotary switch (SW100) to select a number. Set the first card to 0, the second to 1, and so on. The switch has hexadecimal numbers ranging from 0 to F inclusive.

Default line state (SW4)

Perform the following steps for installation:

- Ensure that switch SW4 is in the on-hook position while the card is being installed and activated.
- After the card is activated, set the SW4 switch according to what the default line state should be if the system is down. It is not necessary to set all of the cards in the system to the same default line state.
  - — Set SW4 to on-hook to produce a ringing, no answer response when the system is down.
  - — Set SW4 to off-hook to produce a busy signal when the system is down.

Memory range

The default shared memory range for all D/160SC-LS cards in the system is D0000-D7FFF. All D/160SC-LS cards can share the same memory range.

Figure 19-2: D/160SC-LS card

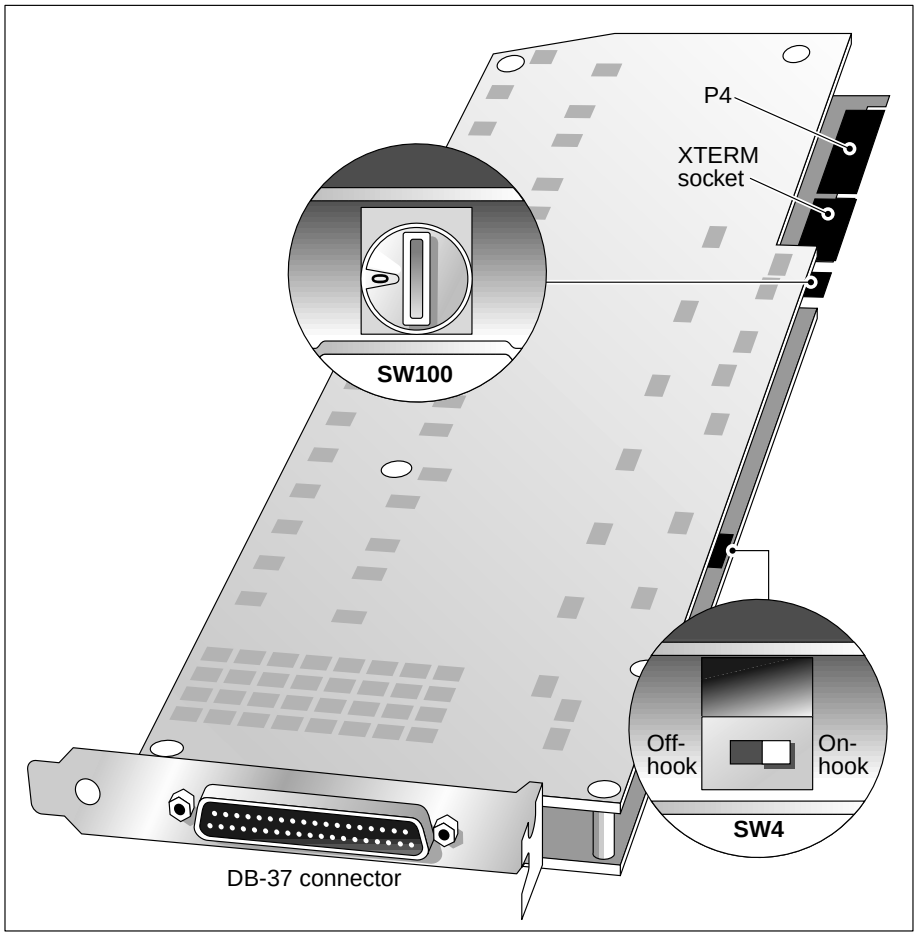


Table 19-2: D/160SC-LS switch settings

Card #	SW100	SW4
1	0	on-hook
2	1	on-hook
3	2	on-hook

Installing the card

To install the card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and power off the system. (See “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8 for more information.)

3 Unplug all power cords for the system from electrical outlets.

4 Remove the cover from the chassis (see Chapter 21, “Replacing hardware components”).

5 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

6 Set the switch settings on the card (see Table 19-2 on page 19-12). SW4 must be set to on-hook during installation and activation.

7 Select an available slot for this card (refer to the *Symposium OPEN IVR Planning and Engineering Guide*).

Note: It is easiest to fill the available slots from left to right.

8 Remove the slot’s retaining screw. If the slot is empty, remove the slot cover. If you are replacing a card in this slot, remove the existing card.

9 Use the slot's card guides as you insert the card edge connector into the slot. Press firmly until the card is securely seated in the slot.

10 Replace and tighten the retaining screw to secure the card.

11 Connect the SCbus cable to the P4 connector on the card and ensure that a PEB terminator is not installed. See Figure 19-2 on page 19-12 for the location of the P4 connector.

12 Repeat steps 6 to 11 for each D/160SC-LS card you are installing.

13 Replace the chassis cover.

14 Connect telephone lines from the backplate of the D/160SC-LS card to the public switch telephone network or to the local PBX, depending on the setup of the system.

15 Plug in power cords, power up the system, and allow the system to boot up normally.

16 Activate the card (see "Activating the D/160SC-LS card" on page 19-15).

17 After the card is activated, set SW4 according to the default line state required by the customer (see "Switch settings" on page 19-11).

18 Run the card diagnostics to ensure the card is functioning properly (see "D/41ESC or D/160SC-LS card" on page 23-36).

Activating the D/160SC-LS card

When the D/160SC-LS card is installed, activate the option using the `/sci/setup` menu as follows.

1 Log in to the MRS or MRS/AP as `service`.

2 Type **`setup`** and press <Enter>.

3 At the `/sci/setup` prompt, type **`trkbrd`** and press <Enter>.

The SCI displays this prompt:

```
Please enter the trunk group number to edit =
```

Each trunk group consists of four voice channels. Therefore, if you are configuring the 16 channels of the first D/160SC-LS card, you would specify group numbers 1 through 4. If you are configuring two D/160SC-LS cards, you would specify group numbers 1 through 8.

4 Type the trunk group range and press <Enter>.

The SCI confirms whether the trunk range has already been activated:

```
Current Trunk Group Does Not Exist - Add it? =
cancel
add      - Add a new entry.
cancel   - Do not add the new entry.
        Trunk Group Does Not Exist - Add it? =
```

5 Type **`add`** and press <Enter> to activate the new range of trunks.

The system displays a screen similar to the following:

```
Current Board Type = d160sc-ls
acl30 - Aculab 30 port E1/ISDN Network Card.
acl60 - Aculab 60 port E1/ISDN Network Card.
aclbri - Aculab BRI ISDN with D/240SC Span Card.
d160sc-ls - A D/160SC-LS 16 channel Loopstart Card.
d240sc-t1 - A D/240SC-T1 high density T1 Span Card.
d240sc-t1gc - 23 port PRI ISDN with D/240SC-T1 Span Card
d300sc-e1gc - 30 port PRI ISDN with D/300SC-E1 Span Card
dti301sc-elg - 30 port CAS with DTI/301SC and D/320SC
Span Cards
d4xe - A D4xE Interface & Springboard.
default - A D/160SC-LS 16 channel Loopstart Card.
             Board Type =
```

6 Type the board type (**d160sc-ls**) and press <Enter>.

The system displays:

```
Default Board Base RAM Address in hex = 0xD0000
Board Base RAM Address in hex =
```

7 Press <Enter> to select the default Board Base RAM address.

The system displays:

```
Default Board Locator address in hex = 0x0
Board Locator address in hex =
```

Note: The Board Locator address 0x0 represents the first telco card. The address for additional cards will be 0x1, 0x2, etc.

8 Press <Enter> to select the default Board Locator address.

The system displays:

```
Current Type of data encoding to use? = mu-law
mu-law - Default data encoding used in the US.
a-law - Default data encoding used in Europe.
Type of data encoding to use? =
```

9 Type **mu-law** or **a-law**, depending on the region, and press <Enter>**.**

The system displays:

```
Current Type of clocking to use? = slave
slave        - Extract clock from the line
resource     - Allow resource boards to control
clocking
master       - Use the internal clock
default      - Extract clock from the line
         Type of clocking to use? =
```

10 Configure the first D/160SC-LS card in the system as master. Configure any additional D/160SC-LS cards as resource. Make your selection and press <Enter>.

The system displays:

```
Current Global Dial Pulse Detection = disabled
enabled     - GDPD is enabled
disabled    - GDPD is disabled
        Global Dial Pulse Detection =
```

11 Type **`disabled`**, unless this card is being installed for the DPD feature, and press <Enter>.

The system displays:

```
Parameter File selection menu
1  -  Select from installed
2  -  Select custom
3  -  Do not use any parameter file(s)
Enter your choice [3] :
```

12 Type **`1`** and press <Enter>.

```
Current Parameter File = 0
0   - GEN_160.prm  D/160-SC LS Generic Parameter file
1   - JP_160.prm   D/160-SC LS Parameter file for Japan
2   - US_160.prm   D/160-SC LS Parameter file for U.S
3    - us_160.prm
        Parameter File =
```

13 Type **`0`** and press <Enter>.

14 Repeat the steps in this procedure to activate all the available trunks.

15 At the `/sci/setup>` prompt, type **`hwsetup`** and press <Enter> to check that the card is configured.

16 At the `/sci/setup>` prompt, type **done** and press <Enter>.

17 To change the default trunk type, use the `/sci/config/trunk` option. See the *Service Console Interface Reference Manual* for instructions.

18 The installation and activation of the D/160SC-LS card is complete. Proceed to the section “Restarting the system” on page 19-25.

T1 interface card (D/240SC-T1)

Description

The D/240SC-T1 card provides a DSX1 network interface to the local T1 carrier system and provides voice and call processing for up to 24 ports in a single slot.

Limitations

Different types of telco cards cannot be installed in the same MRS or MRS/AP.

Switch settings

Board locator switch (SW100)

Switch SW100 is used to assign the unique board locator ID. Do not set two cards to the same number. Perform the following for installation:

- Dial the rotary switch (SW100) to select a number. Set the first card to 0, the second to 1, and so on. The switch has hexadecimal numbers ranging from 0 to F inclusive.

Remote Loopback Switch

The loopback switch is factory set to ON for normal mode. After the card has been installed and activated by Nortel, you can move the loopback switch to the OFF position for loopback mode for testing. Do not set to OFF unless specifically instructed to do so as part of a diagnostic test. Perform the following step for installation:

- Ensure that the loopback switch is in the ON (up) position.When the loopback switch is in the ON position, the red loopback indicator illuminates and the system retransmits any data received.

Memory range

The default memory range for all D/240SC-T1 cards in the system is D0000-D7FFF. All D/240SC-T1 cards can share the same memory range.

Trunk types and supported T1 configurations

Through the use of different Trunk Type files in the software, the D/240SC-T1 card can support the following T1 configurations:

Table 19-3: Trunk types and supported T1 configurations.

FXS-T1-Loopstart	T1 transmission with loopstart interface (foreign exchange).
INV-T1-E&M	Inv A/B bit signaling. Standard T1-E&M.
T1-E&M-B	Used for High Density T1 — no ANI and no DNIS.
T1-W-ANI-E&M	Used for High Density T1 — issues a wink signal to the switch and collects 10 DTMF ANI digits.
T1-W-D-A-E&M	Used for High Density T1 — issues a wink signal to the switch and collects 4 DTMF DNIS digits and 10 ANI DTMF digits.
T1-W-DNIS-E&M	Used for High Density T1 — issues a wink and collects 4 DNIS DTMF digits.
T1-W-E&M	Used for High Density T1 — issues a wink and no DNIS or ANI digits collected. Used when not collecting any called or calling numbers.

Figure 19-3: T1 Interface module

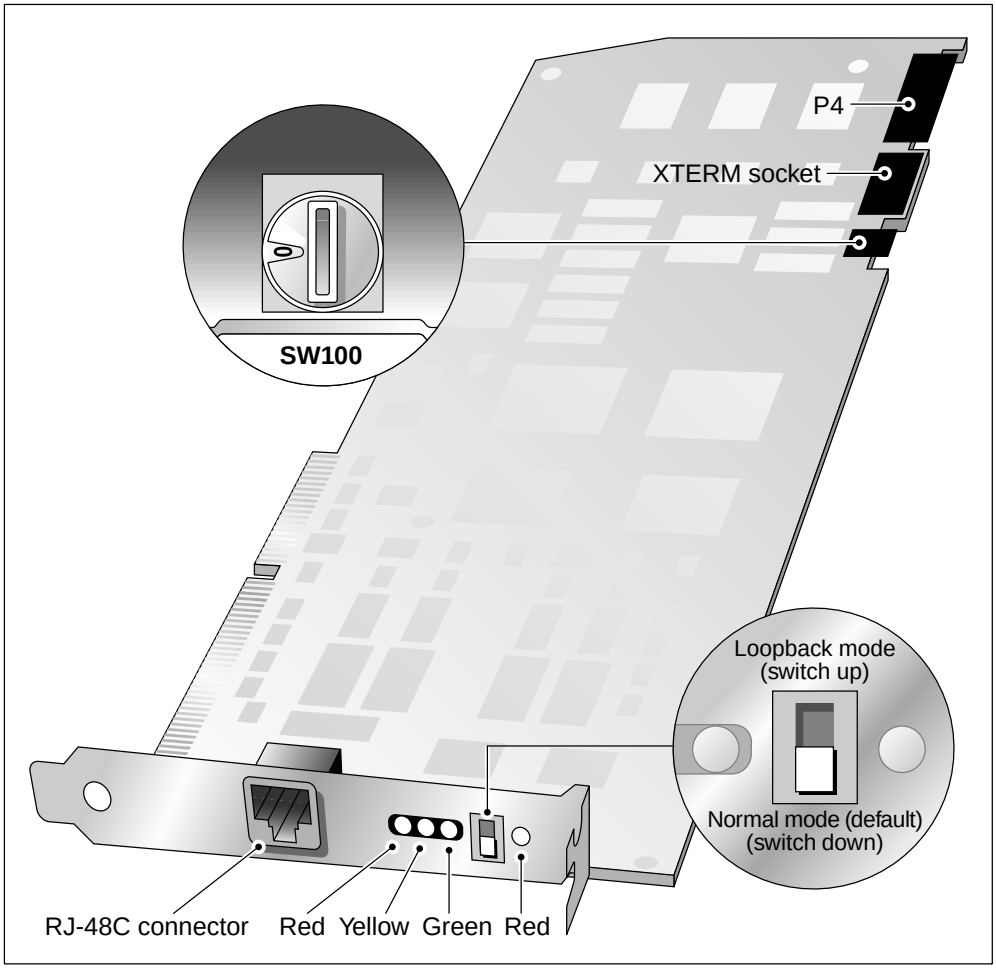


Table 19-4: Switch settings for SW100

Card #	SW100
1	0
2	1
3	2
4	3
5	4

Installing the card

To install the card, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and power off the system. (See “Shutting down the AP or MRS/AP” on page 2-7 and “Shutting down the MRS” on page 2-8 for more information.)

3 Unplug all power cords for the system from electrical outlets.

4 Remove the cover from the chassis (see Chapter 21, “Replacing hardware components”).

5 Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

6 Set the switch settings on the card (see “Switch settings” on page 19-18).

7 Select an available slot for this card (refer to the *Symposium OPEN IVR Planning and Engineering Guide*).

Note: It is easiest to fill the available slots from left to right.

8 Remove the slot’s retaining screw. If the slot is empty, remove the slot cover. If you are replacing a card in this slot, remove the existing card.

9 Use the slot’s card guides as you insert the card edge connector into the slot. Press firmly until the card is securely seated in the slot.

10 Replace and tighten the retaining screw to secure the card.

11 Connect the SCbus to the P4 connector on the card and ensure that a PEB terminator is not installed. See Figure 19-3 on page 19-20 for the location of the P5 connector.

12 Repeat steps 6 to 11 for each D/240SC-T1 card you are installing.

13 Replace the chassis cover.

14 Connect telephone lines from the RJ48C connector on the backplate of the D/240SC-T1 card to the public switch telephone network or to the local PBX, depending on the setup of the system.

15 Plug in power cords, power up the system, and allow the system to boot up normally.

16 Activate the card (see “Activating the D/240SC-T1 card” on page 19-23).

17 Run the card diagnostics to ensure the card is functioning properly (see “D/240SC-T1 or D/320SC card” on page 23-37).

Activating the D/240SC-T1 card

When the D/240SC-T1card is installed, activate the option using the `/sci/setup` menu as follows.

1 Log in to the MRS or MRS/AP as `service`.

2 Type **`setup`** and press <Enter>.

3 At the `/sci/setup` prompt, type **`trkbrd`** and press <Enter>.

The SCI displays this prompt:

```
Please enter the trunk group number to edit =
```

Each trunk group consists of four voice channels. Therefore, if you are configuring the 24 channels of the first D/240SC-T1 card, you would specify group numbers 1 through 6. If you are configuring two D/240SC-T1 cards, you would specify group numbers 1 through 12.

4 Type the trunk group range (in increments of 6 for T1) and press <Enter>.

The SCI confirms whether the trunk range has already been activated:

```
Current Trunk Group Does Not Exist - Add it? =
cancel
add      - Add a new entry.
cancel   - Do not add the new entry.
        Trunk Group Does Not Exist - Add it? =
```

5 Type **`add`** and press <Enter> to activate the new range of trunks.

The system displays a screen similar to the following:

```
Current Board Type = d160sc-ls
acl30 - Aculab 30 port E1/ISDN Network Card.
acl60 - Aculab 60 port E1/ISDN Network Card.
aclbri - Aculab BRI ISDN with D/240SC Span Card.
d160sc-ls - A D/160SC-LS 16 channel Loopstart Card.
d240sc-t1 - A D/240SC-T1 high density T1 Span Card.
d240sc-t1gc - 23 port PRI ISDN with D/240SC-T1 Span Card
d300sc-e1gc - 30 port PRI ISDN with D/300SC-E1 Span Card
dti301sc-elg - 30 port CAS with DTI/301SC and D/320SC
Span Cards
d4xe - A D4xE Interface & Springboard.
default - A D/160SC-LS 16 channel Loopstart Card.
             Board Type =
```

6 Type the board type (**d240sc-t1**, or **d240sc-t1gc** if the card is being installed for ISDN PRI) and press <Enter>. For ISDN PRI installation, refer to the *Symposium OPEN IVR CAS and ISDN Signaling Guide*.

The system displays:

```
Default Board Base RAM Address in hex = 0xD0000
Board Base RAM Address in hex =
```

7 Press <Enter> to select the default Board Base RAM address.

The system displays:

```
Current Type of clocking to use? = slave
slave    - Extract clock from the T-1 line
resource    - Allow resource boards to control clocking
master   - Use the internal clock
default  - Extract clock from the T-1 line
        Type of clocking to use? =
```

8 Configure the first D/240SC-T1 card in the system as slave. Configure any additional D/240SC-T1 cards as resource. Make your selection and press <Enter>.

The system displays:

```
Default Board Locator address in hex = 0x0
Board Locator address in hex =
```

Note: The Board Locator address 0x0 represents the first telco card. The address for additional cards will be 0x1, 0x2, etc.

9 Press <Enter> to select the default Board Locator address.

The system displays:

```
Current Type of data encoding to use? = mu-law
mu-law - Default data encoding used in the US.
a-law - Default data encoding used in Europe.
Type of data encoding to use? =
```

10 Type **mu-law** and press <Enter>.

Note: The D/240SC-T1 card supports `mu-law` only.

11 Repeat the steps in this procedure to activate all the available trunks.

12 At the `/sci/setup>` prompt, type **`hwsetup`** and press <Enter> to check that the card is configured.

13 At the `/sci/setup>` prompt, type **done** and press <Enter>.

14 Modify the T1 span parameters using the `/sci/config/t1span` option. See the *Service Console Interface Reference Manual* for instructions.

15 To change the default trunk type, use the `/sci/config/trunk` option. See the *Service Console Interface Reference Manual* for instructions.

16 The installation and activation of the D/240SC-T1 card is complete. Go to the section “Restarting the system” on page 19-25.

Restarting the system

Restart the MRS for your installation of the option to take effect. To restart the MRS, follow these steps:

1 Ensure that you remove any diskette from the floppy drive.

2 At the `/sci` prompt, type **`maint restart`** and press <Enter>.

The system verifies the integrity of the newly installed packages and informs you of any inconsistencies.

The MRS starts to come down. The system automatically reboots once it reaches the shutdown state.

Allow the system to boot up normally which can take several minutes.

When the system comes up, the new installation is in effect.

Chapter 20: Dial Pulse Detection option

Introduction

Symposium OPEN IVR 4.0 supports the Dial Pulse Detection (DPD) feature on the following cards:

- D/41ESC (specially enabled for DPD by Nortel)
- D/160SC-LS-IDPD
- D/320SC-IDPD

Note: DPD is not field upgradable. DPD cards must be provided by Nortel.

DPD Features

DPD offers the following features:

- Dial Pulse Detection (DPD) capability is performed by the DPD-enabled boards.
- Initial zero-training is not required. The DPD algorithm is adaptive and can train on any large DPD digit (digit '5' or greater).
- DPD performs simultaneously with DTMF detection and can differentiate between a DTMF or pulse dialed (DPD) digit.
- DPD supports dial pulse cut-through with local echo cancellation.
- DPD supports a generic 10 pulses per second (pps) parameter file for all unsupported countries in the areas where 10 pps is a standard dialing rate for dial-pulse telephones.
- DPD is *not* a shared resource; it is enabled on all channels on the boards that are capable of DPD.

- DPD does not require complex resource management and is practically invisible to the application developer. The dial pulse detection becomes visible to the developer if zero-training is used.

  Note: When DPD is enabled on a board, the speed control feature does not work on that board with dial pulse detection capability.

Country parameters

The DPD algorithm was specifically tuned based on detailed data collection from the following countries:

- Brazil
- Colombia
- Argentina
- Venezuela
- India
- Mexico

For countries not listed above, Nortel recommends that you use a generic algorithm. As more countries are qualified for DPD, they will be made available in future releases of Symposium OPEN IVR software.

User issues

With DPD, if the termination digit is used when recording a message, the message may have clicks at the end.

Activating the DPD feature

Activation of the DPD feature is done on a trunk group basis in four-port increments.

> ***Note:*** A list of the trunk groups installed is available by navigating to `sci/setup/hwsetup`.

To activate the DPD feature, follow these steps.

1 Log in to the MRS or MRS/AP as `service`.

2 Type **`setup`** and press <Enter>.

3 At the `/sci/setup` prompt, type **`trkbrd`** and press <Enter>.

The system displays this prompt:

```
Please enter the trunk group number to edit =
```

4 At the prompt, type the number of the trunk group to edit and press <Enter>.

For existing trunk groups, you must first delete the trunk group and then add it. The system prompts you to delete the trunk group. Go to step 5.

If you are adding a new trunk group, go to step 8.

5 To delete the trunk group, type **`delete`** at the prompt and press <Enter>.

6 At the `/sci/setup` prompt, type **`trkbrd`** and press <Enter>.

7 At the prompt `Please enter the trunk group number to edit =` , type the trunk group number you just deleted and press <Enter>.

The system displays:

```
Current Trunk Group Does Not Exist - Add it? =
cancel
add      - Add a new entry.
cancel   - Do not add the new entry.
        Trunk Group Does Not Exist - Add it? =
```

8 Type **add** and press <Enter>.

The system displays a screen similar to the following:

```
Current Board Type = d160sc-ls
acl30 - Aculab 30 port E1/ISDN Network Card.
acl60 - Aculab 60 port E1/ISDN Network Card.
aclbri - Aculab BRI ISDN with D/240SC Span Card.
d160sc-ls - A D/160SC-LS 16 channel Loopstart Card.
d240sc-t1 - A D/240SC-T1 high density T1 Span Card.
d240sc-t1gc - 23 port PRI ISDN with D/240SC-T1 Span Card
d300sc-e1gc - 30 port PRI ISDN with D/300SC-E1 Span Card
dti301sc-elg - 30 port CAS with DTI/301SC and D/320SC
Span Cards
d4xe - A D4xE Interface & Springboard.
default - A D/160SC-LS 16 channel Loopstart Card.
             Board Type =
```

9 Type the card type (from the list that is displayed) and press <Enter>.

The system displays:

```
Default Board Base RAM Address in hex = 0xD0000
Board Base RAM Address in hex =
```

10 Press <Enter> to select the default Board Base RAM address.

The system displays:

```
Default Board Locator address in hex = 0x0
Board Locator address in hex =
```

Note: The Board Locator address 0x0 represents the first telco card. The address for additional cards will be 0x1, 0x2, etc.

11 Press <Enter> to select the default Board Locator address.

The system displays:

```
Current Type of data encoding to use? = mu-law
mu-law - Default data encoding used in the US.
a-law - Default data encoding used in Europe.
Type of data encoding to use? =
```

12 Type **mu-law** or **a-law**, depending on the region, and press <Enter>**.**

Note: For D/41ESC cards on a PEB-based system, the response must be **a-law** for all regions.

The system displays:

```
Current Type of clocking to use? = slave
slave       - Extract clock from the line
resource    - Allow resource boards to control
clocking
master      - Use the internal clock
default     - Extract clock from the line
        Type of clocking to use? =
```

13 Configure the first telco card in the system as master. Configure any additional telco cards as resource. Make your selection and press <Enter>.

The system displays the following information:

```
Current Global Dial Pulse Detection = disabled
enabled - DPD is enabled
disabled - DPD is disabled
Global Dial Pulse Detection =
```

14 Type **enabled** and press <Enter>.

The system displays the following information:

```
Current Global Dial Pulse Detection zero-training =
disabled
enabled - zero-training for DPD is enabled
disabled - zero-training for DPD is disabled
Global Dial Pulse Detection zero-training =
```

15 Type **disabled** and press <Enter> to continue.

The system displays the following information:

```
Parameter File selection menu
1 - Select from installed
2 - Select custom
3 - Do not use any parameter file(s)
Enter your choice [3]:
```

16 Type **1** and press <Enter> to select from the pre-installed parameter files. The system displays something similar to the following:

```
Current Parameter File = 0
0 - GEN_41E.prm D41E-SC Generic Parameter file
1 - US_41E.prm D/41E-SC Parameter file for U.S.
Parameter File =
```

17 At the prompt, type **1** and press <Enter> to continue.

After the DPD feature is added to a board configuration, it is displayed under the Trunk Group Information.

For example, if you are using the `/sci/setup>hwsetup` command, the system displays something similar to the following:

```
TRUNK GROUPS INSTALLED
trunk group 1 at I/O 000 RAM D0000 type d4xe on
SCBUS 0 GDPD
```

18 Go to the `sci/maint` menu.

19 Type **`restart`** and press <Enter> to reboot the system and activate the DPD feature.

Chapter 21: Replacing hardware components

Overview

This chapter describes how to replace hardware components. For a description of hardware components, refer to the *Symposium OPEN IVR Product Guide*.

The procedures are grouped into the following sections:

- "Section A: Tower AP (300tp) and MRS/AP (300tp)" on page 21-2
- "Section B: Tower AP (700tp), MRS/AP (700tp), and MRS/Tower" on page 21-12
- "Section C: Rack AP and MRS/Rack" on page 21-26

Release 2.x hardware platforms

For instructions on replacing or maintaining Release 2.x hardware platforms, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*.

Section A: Tower AP (300tp) and MRS/AP (300tp)

Overview

This section includes the following topics for the 300tp Tower AP and the 300tp MRS/AP:

- "Removing and replacing the chassis cover" on page 21-2
- "Replacing the cooling fan" on page 21-6
- "Removing or replacing the air filter" on page 21-10

Removing and replacing the chassis cover

Description

The chassis cover is secured to the chassis with three screws and a lock. It provides access to the 9 ISA/1 SBC/4 PCI slot passive backplane and other internal components.

Requirements

You will need the following item:

- customer's chassis keys

Removing the chassis cover

To remove the chassis cover, follow these steps.

DANGER

Risk of electric shock

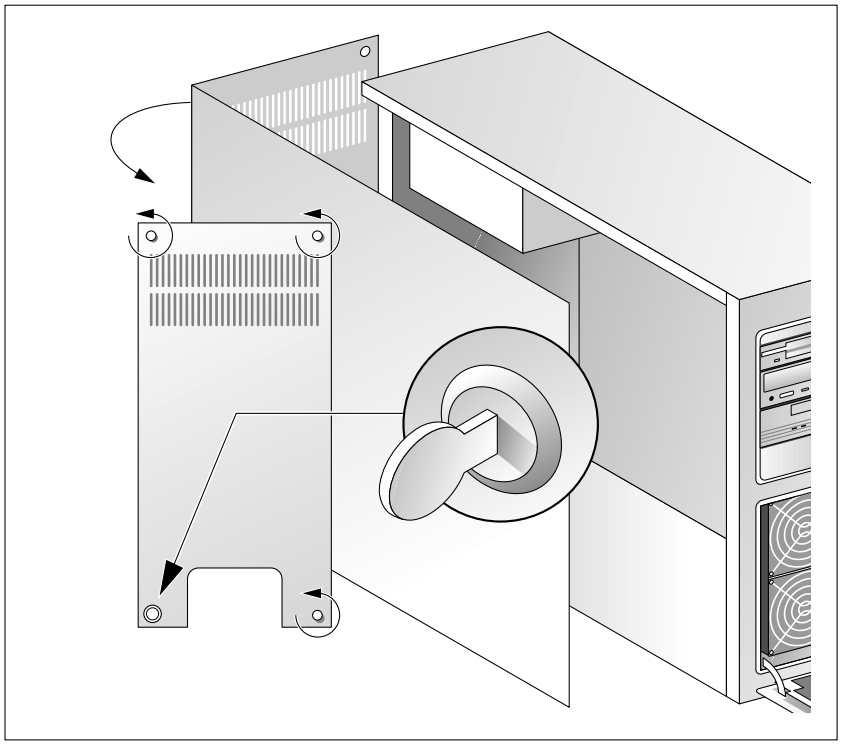
High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 21-1: Tower AP or MRS/AP chassis cover removal



1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power down the system. (See “Shutting down the AP or MRS/AP” on page 2-7 for more information.)

3 Disconnect the power cord from the power outlet.

4 If necessary, disconnect the communication cables.

5 Move the system so that there is a minimum of four feet of unencumbered space at the rear of the chassis.

6 Obtain the chassis key from the customer and unlock the chassis cover at the rear of the chassis.

7 Loosen the three thumbscrews located at the rear of the chassis.

8 Slide the cover toward the rear of the chassis until it is free.

9 If you need to access cards inside the chassis, remove the card retaining arm.

Replacing the chassis cover

1 Replace the card retaining arm if it was removed.

2 Align the cover with the chassis so that the contoured lip at the top of the cover fits under the chassis, and the curved lip at the bottom of the cover fits over the chassis.

3 Slide the cover toward the front of the chassis until it fits smoothly and securely with the chassis.

4 Lock the cover at the rear of the chassis and return the key to the customer.

5 Reconnect the communication cables if they were disconnected.

Note: This includes cables for the video, network, keyboard, mouse, or any other cards or devices.

6 Reconnect the power cable to the power outlet.

7 Power on the Tower AP or MRS/AP.

Replacing the cooling fan

Description

The Tower AP supports two cooling fans, stacked vertically, and located at the front of the chassis. Fans are accessed through the lower front door without removing the chassis cover. Although fans are removed individually, both should be replaced at the same time.

Requirements

You will need the following items:

- antistatic wrist strap
- Phillips-head screw driver
- the replacement component(s)
- customer keys for the chassis

Procedure for removing the cooling fan

To remove the cooling fan, follow these steps.

DANGER

Risk of electric shock

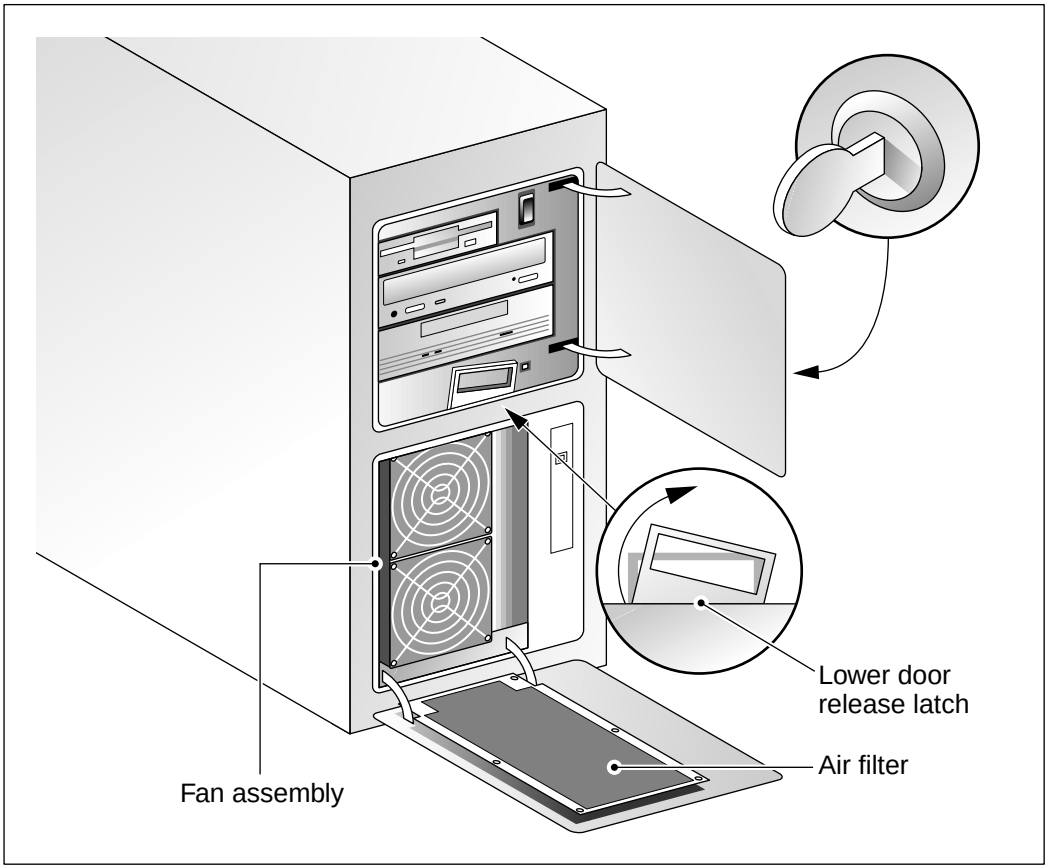
High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 21-2: Fan assembly location



1. Shut down and then power down the system. (See “Shutting down the AP or MRS/AP” on page 2-7 for more information.)
2. Disconnect the power cord from the power outlet.
3. Unlock and open the drive bay door.
4. Locate the square latch that rests on top of the lower front door, and pull up on it.

   The latch dislocates, resting at an angle and releasing the lower front door.
5. Unplug the red and black power lead from the white connector located to the upper right side of the fan assembly.

6 Loosen the four Phillips-head screws securing each fan to the underframe of the chassis.

7 Remove both fans from the chassis.

8 Align each replacement fan with the chassis underframe.

9 Tighten screws, securing the fans to the underframe.

10 Reconnect the red and black power lead to the white power connector.

11 Close the lower front door, then close and lock the drive bay door.

12 Return the drive bay key to the customer.

13 Reconnect the power cord.

14 Power on the server.

Removing or replacing the air filter

Description

The Tower AP air filter is a small, rectangular piece of material that rests under a frame adjacent to the cooling fans. It is made of reticulated polyester foam and is flame retardant to FMV55302. The filter should be removed and cleaned periodically. It should be replaced as needed, when it becomes damaged or inefficient.

Requirements

You will need the following items:

- one wrench, to remove nuts
- the replacement filter (if necessary)
- customer’s chassis keys

Procedure for removing or replacing the air filter

To remove or replace the air filter, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Unlock and open the drive bay door.

2 Locate the square latch that rests on top of the lower front door, and pull up on it (see Figure 21-2 on page 21-8).

The latch dislocates, resting at an angle and releasing the lower front door.

3 Locate the air filter on the inside of the lower door.

4 Loosen the six nuts that secure the air filter frame.

5 Loosen or remove the outer frame and slide out the filter which sits inside it.

6 If the filter is not damaged, clean it by rinsing it in warm water.

If the filter is damaged, slide the replacement filter into the frame.

7 Align the outer frame over the nut screws, and rest it on the filter so that the filter is secured between the two frames.

8 Tighten the nuts onto the outer frame.

9 Close both front chassis doors and lock the drive bay door.

10 Return the chassis keys to the customer.

Section B: Tower AP (700tp), MRS/AP (700tp), and MRS/Tower

Overview

This section describes how to replace hardware components for the Tower AP (700tp), MRS/AP (700tp), and MRS/Tower.

Specific topics include:

- "Removing and replacing the chassis cover" on page 21-13
- "Removing or replacing the air filter" on page 21-16
- "Replacing the fan assembly" on page 21-19
- "Replacing the power supply" on page 21-22

Removing and replacing the chassis cover

Description

You need to remove the chassis cover to access the system hardware.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

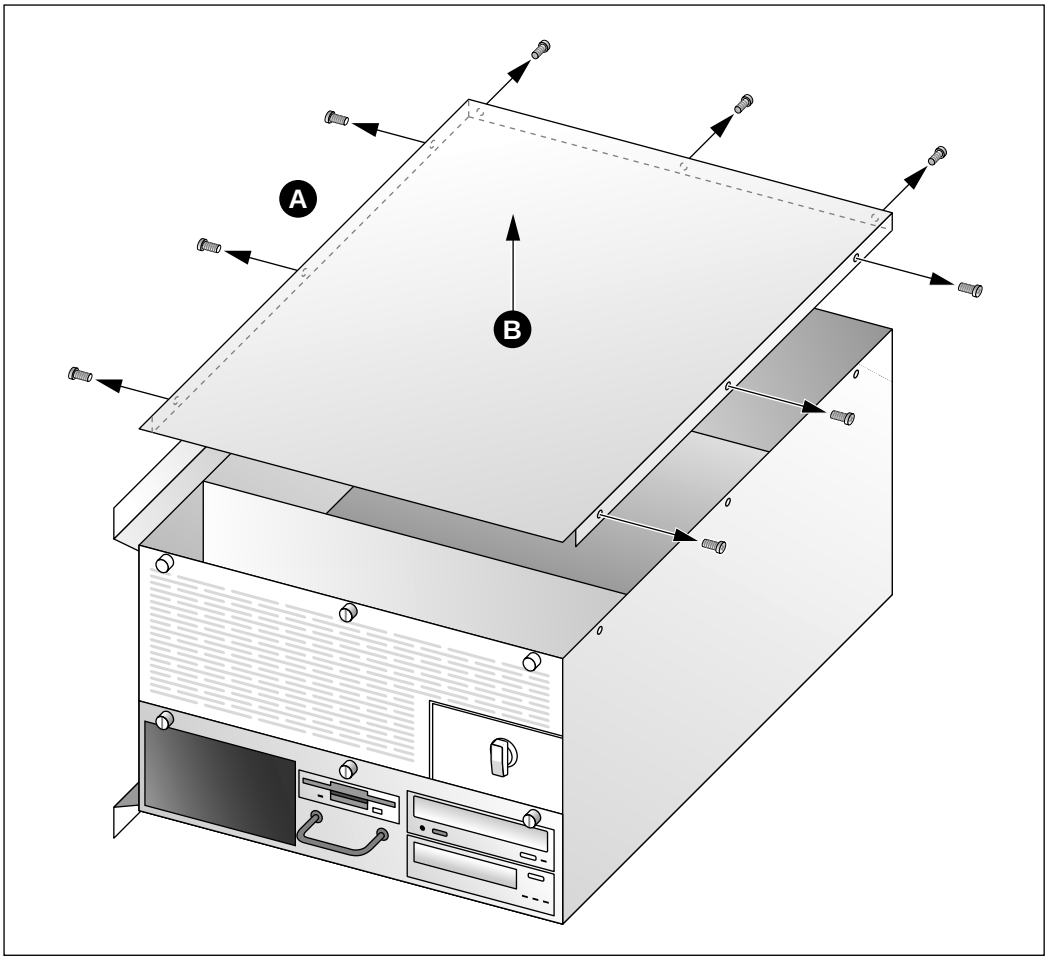
Requirements

You will need the following items:

- antistatic wrist strap
- Phillips-head screw driver

Removing the chassis cover

To remove the chassis cover, follow these steps.



1. Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.
2. Shut down and then power down the system. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8.)
3. Unplug the AC power cord from the chassis and the AC outlet.
4. If necessary, disconnect the communication cables.

5 Turn the server on its side so that the media tray is at the bottom and the chassis cover is on top.

6 Remove the nine Phillips-head screws that secure the cover. When the unit is on its side, three screws are on the left and right sides and three are at the rear of the chassis.

7 Remove the chassis cover by pulling the cover toward the rear of the chassis, then lifting it up and off.

8 Remove the two Phillips-head screws that hold the card retaining arm.

9 Remove the card retaining arm.

Replacing the chassis cover

1 Replace the card retaining arm.

2 Reposition the cover on the chassis starting from the rear of the chassis.

3 Secure the chassis cover using the nine screws previously removed.

4 Turn the unit to stand on its base.

5 Reconnect the communication cables if they were disconnected.

Note: This includes cables for the video, network, keyboard, mouse, or any other cards or devices.

6 Reconnect the power supply cable.

7 Power on the server.

Removing or replacing the air filter

Description

The air filter is located inside the air filter grill which is secured to the front of the chassis with three thumbscrews. It is to the left of the media drive tray. Air filters should be removed and cleaned periodically to ensure your server cools and functions properly. If they are damaged or dirty, the filters should be replaced.

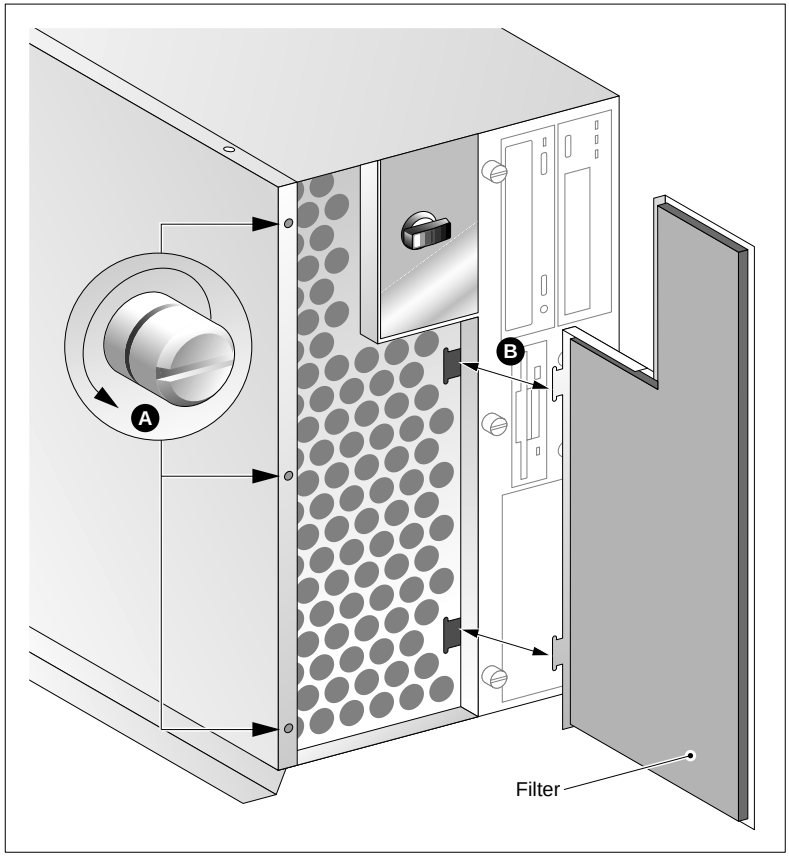
Requirements

- replacement air filter

Procedure for removing or replacing the air filter

This procedure can be performed with the unit in the upright position, as shown in Figure 21-3.

Figure 21-3: Removing the air filter



1 Unscrew the three thumbscrews at the left side of the front panel.

The thumbscrews rotate freely after the threads are completely released.

2 Pull the filter to the left and away from the chassis.

Note: The filter cover is attached to the chassis with three notched tabs that release from the chassis.

3 Remove the filter.

Note: The filter is positioned under an overhanging lip at the left of the chassis. It rests on a thin shelf formed from the chassis.

4 Clean the filter, or replace with a new filter.

5 Reposition the new or cleaned filter on the front of the chassis.

Note: It must cover the circular ventilation holes and be positioned on the thin shelf of chassis metal.

6 Tuck the left of the filter under the overhanging lip.

7 Replace the filter cover.

8 Tighten the three thumbscrews to secure the filter cover.

Replacing the fan assembly

Description

The fan assembly consists of three cooling fans mounted on a frame. It is designed to cool the entire chassis and is located just behind the front panel. It slides into the metal divider frame designed for it. When one fan fails the complete assembly must be replaced.

Requirements

- antistatic wrist strap
- flat-blade screwdriver
- Phillips head screwdriver
- replacement fan assembly

Procedure for replacing the fan assembly

To replace the fan assembly, follow these steps.

DANGER

Risk of electric shock

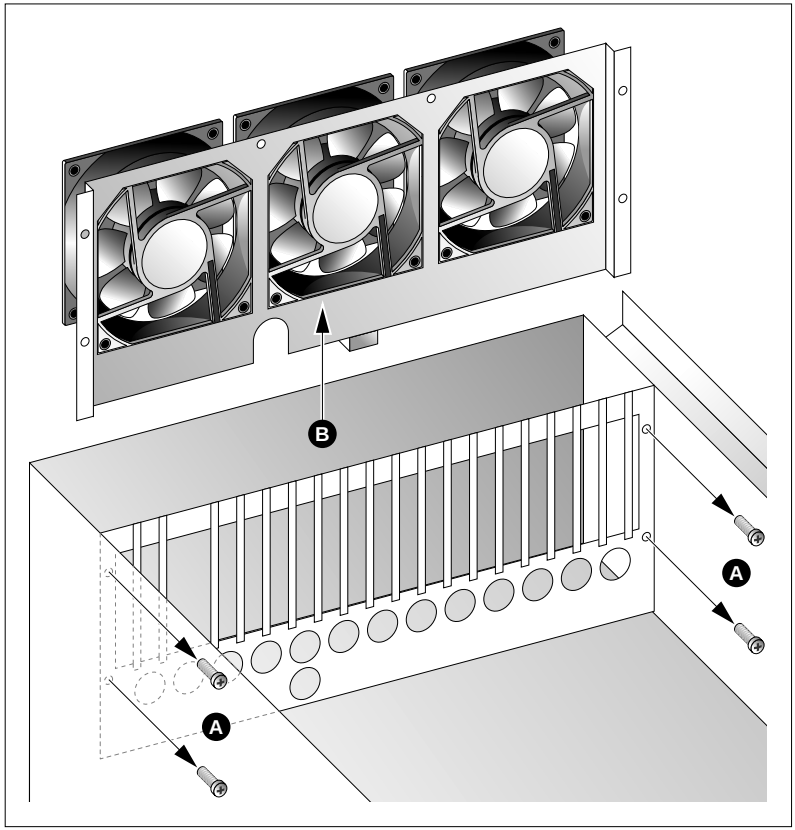
High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 21-4: Removing the fan assembly



1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power down the system. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8.)

3 Unplug the AC power cord from the chassis and the AC outlet.

4 Turn the server on its side so that the drive tray is at the bottom and the cover on top.

5 Remove the drive tray. See “Removing the drive tray from the chassis” on page 22-18.

6 Remove the chassis cover.

7 Put on an ESD wrist strap and attach it to an unpainted metal portion of the chassis.

8 Observe the arrangement of cards installed. Locate the four screws, two on each side that secure the fan assembly to the divider frame.

If the cards installed prevent access to the screws, remove the cards first.

9 Remove the four screws.

10 Disconnect the power connector of the fan assembly.

11 Slide the fan assembly up and out.

12 Slide the new fan assembly in.

13 Reconnect the *small* power connector of the fan assembly.

CAUTION

Risk of damage to power supply wires

Do not connect the large power connector. If you do, it will be cut when you slide in the drive tray. The small power connector is sufficient.

14 Replace the four screws to secure the assembly.

15 Replace cards, if any were removed.

16 Reinstall the drive tray. See “Reinstalling the drive tray” on page 22-27.

17 Replace the chassis cover.

18 Turn the unit to stand on its base.

19 Reconnect the AC power cord.

20 Power on the server.

Replacing the power supply

Description

The power supply is located at the rear of the chassis. To perform this procedure it is necessary to remove the chassis cover, fan assembly, and cards.

Requirements

- antistatic wrist strap
- flat-blade screwdriver
- cable ties
- pliers
- replacement power supply

Procedure for replacing the power supply

To replace the power supply, follow these steps.

DANGER

Risk of electric shock

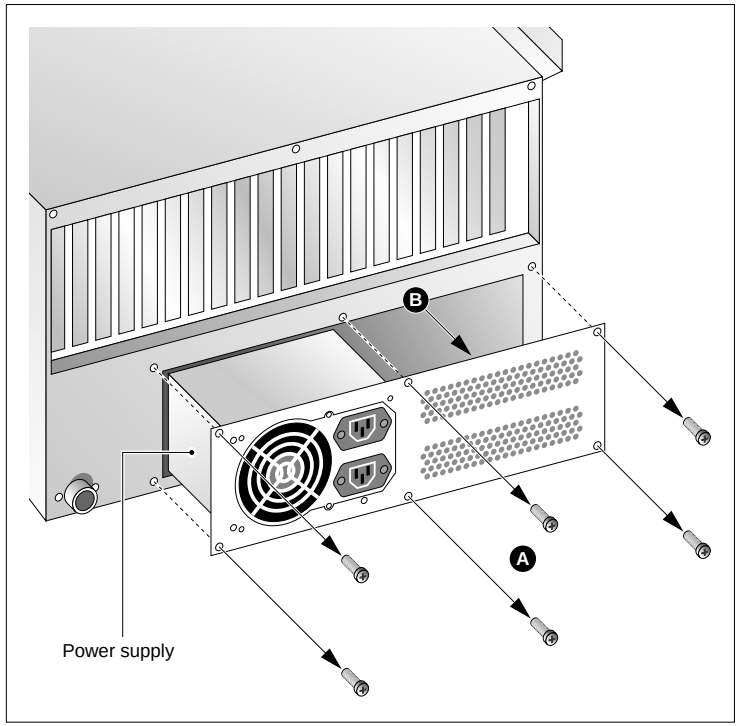
High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 21-5: Replacing the power supply



1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power down the system. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8.)

3 Unplug the AC power cord from the chassis and the AC outlet.

4 Turn the server on its side so that the drive tray is at the bottom and the cover on top.

5 Remove the chassis cover.

6 Put on an ESD wrist strap and attach it to an unpainted metal portion of the chassis.

7 Remove the card retainer bar.

8 Remove the six Phillips screws at the rear of the server that secure the power supply unit’s panel.

9 Slide the power supply out about three centimeters.

10 Remove the four Phillips screws that secure the power supply to its panel.

11 Unplug the power connectors that connect the server's installed devices to the power supply.

Note: There will be one power connector each to the floppy drive, hard disk(s), tape drive, and CD-ROM drive. Always hold the connector and unplug. Do not pull the wire to unplug the connector.

12 Unplug the two power connectors that connect the power supply to the backplane.

Note: Each connector has four wires. Observe how the two black wires of each connector are positioned. The black wire of one connector must always be positioned next to the black wire of the other connector.

13 Remove all cards from their slots.

a Remove the slot's retaining screw.

b Remove the card.

14 Remove the fan assembly.

15 Remove the plastic card guides.

16 Cut the cable tie that holds the internal power cable together with other cables. The cables are tied at the point where they pass through the opening in the metal divider.

17 Disconnect the four connectors that connect the internal power cable to the server's on/off power switch.

Note: Observe the color of the wires and where they connect.

18 Guide the cables out and remove the power supply unit.

19 Guide the cables of the new power supply unit into the server.

20 Connect the internal power cable that attaches to the power on/off switch first.

Note: The cable consists of four wires that are color coded. Colors are blue, brown, white, and black. There is a diagram on the power supply unit showing the required position for each connector.

CAUTION

Risk of blowing the customer's fuse

If the wires are connected incorrectly the customer's fuse will blow.

21 Secure the internal power cable with other internal cables that pass through the opening in the metal divider. Use a cable tie.

22 Replace the plastic card guides for the PCI cards and the SBC card.

23 Replace the fan assembly.

24 Reinstall all cards that were removed for this procedure.

25 Plug the two power connectors to the backplane.

Note: The black wires of both connectors must be together, not at opposite ends of the connecting socket.

26 Connect the server's installed devices.

27 Fasten the power supply unit to its back panel with four Phillips head screws.

28 Slide the power supply unit into the server.

29 Fasten the back panel of the power supply unit to the server with six Phillips screws.

30 Replace the card retainer bar.

31 Replace the chassis cover.

32 Turn the unit to stand on its base.

33 Reconnect the power supply cable.

34 Switch the server on.

Section C: Rack AP and MRS/Rack

Overview

This section describes how to replace hardware components for a Rack AP or MRS/Rack. The components and procedures described in this section are common to the Rack AP and MRS/Rack.

Specific topics include:

- "Removing and replacing the chassis cover" on page 21-28
- "Removing and replacing the front bezel" on page 21-30
- "Removing or replacing air filters" on page 21-32
- "Replacing the cooling fan" on page 21-33
- "Replacing the power supply" on page 21-36
- "Replacing the fuse" on page 21-38
- "Replacing the display panel and alarm board" on page 21-40

Replacing hot-swappable components

If your system experiences problems with either the cooling fan or the power supply, you can replace these parts without shutting down the server. These hot-swappable components enable you to leave the server on and operational while you replace redundant components.

The components that can be hot-swapped are:

- cooling fans in a Rack AP and MRS/Rack
- power supplies for Rack APs and MRS/Racks if two power supplies are installed
- hard disks in a Rack AP and MRS/Rack; for details on replacing hard disks, see "Adding or replacing a hard disk" on page 22-30.

Using the LED displays

Power supply, fan, and chassis temperature status are constantly monitored through the LED displays on the front panel. In the event of a failure, a system alarm is triggered. For the power supply and cooling fans, the LED turns red in the event of a failure.

Removing and replacing the chassis cover

Description

The chassis cover protects the top of the server. Removing the cover enables you to access the 16 ISA/1 SBC/3 PCI Slot passive backplane and other internal components.

Requirements

You will need the following items:

- antistatic wrist strap
- flat-blade screwdriver

Removing the chassis cover

To remove the chassis cover, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power down the server and disconnect all power cords. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8 for more information.)

3 For AC models, unplug the AC power cord from the chassis and the AC outlet.

4 If necessary, disconnect the communication cables.

5 Loosen the three thumbscrews at the rear of the top cover.

6 Remove the top cover by pulling the cover toward the rear of the chassis, then lifting it up and off.

Replacing the chassis cover

1 Reposition the top cover on the chassis starting from the rear of the chassis.

2 Secure the three thumbscrews at the rear of the top cover.

3 Reconnect the communication cables if they were disconnected.

4 Plug the AC power cord in the chassis and the AC outlet.

5 Power on the server.

Removing and replacing the front bezel

Description

The plastic front bezel has two locked doors that enable you to access the external peripheral bay, SCA disk drives, 3.5-inch floppy drive, and removable cooling fans.

Requirements

You will need the following items:

- keys to the front bezel
- antistatic wrist strap

CAUTION

Risk of equipment damage

Do not attempt to move or lift the server before removing the front bezel; the server may disengage from the bezel and fall.

Removing the front bezel

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

To remove the front bezel, follow these steps.

1 Unlock and open the double doors of the front bezel.

2 Firmly grasp the bezel by the hand-holds at either side of the chassis.

3 Pull the bezel from the chassis.

Replacing the front bezel

To replace the bezel, follow these steps.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1. Align the front bezel with the ball studs located at each faceplate corner.
2. Apply pressure evenly until the bezel snaps onto each ball stud.
3. Close the double doors of the front bezel and lock it into place.

Removing or replacing air filters

When to remove or replace

Air filters should be removed and cleaned periodically to ensure your server cools and functions properly. If they are damaged or become inefficient, the filters should be replaced.

Locating the air filters

There are four air filters on the Rack AP and MRS/Rack. One inside each of the two doors of the front bezel and two on the top half of the front bezel. They are made of polyester foam material and are flame retardant.

Requirements

You will need the following items:

- customer's chassis keys
- replacement air filter(s)

Removing or replacing the front bezel air filter

1. Remove the front bezel from the chassis.
2. Pull filters from the velcro strips securing them to the bezel.
3. Replace the filter by seating new filter pads evenly over the velcro strips and securing them.
4. Install and lock the front bezel on the chassis.

Removing or replacing the door air filter

1. Unlock and open the front doors.
2. The air filter is trapped between the inside of the door and the wire. The wire pivots near the key lock.
3. Pull the wire away from the key lock to free the air filter.
4. Remove and replace the air filter.
5. Pivot the wire to trap the filter, ensuring that the ends of the wires are pinched inside the door.
6. Close and lock the doors.

Replacing the cooling fan

When to replace the cooling fan

When the LED associated with a cooling fan goes from green to red, the fan requires replacement.

Requirements

You will need the following items:

- antistatic wrist strap
- flat-blade screwdriver
- the replacement cooling fan module(s)

Hot-swapping a cooling fan

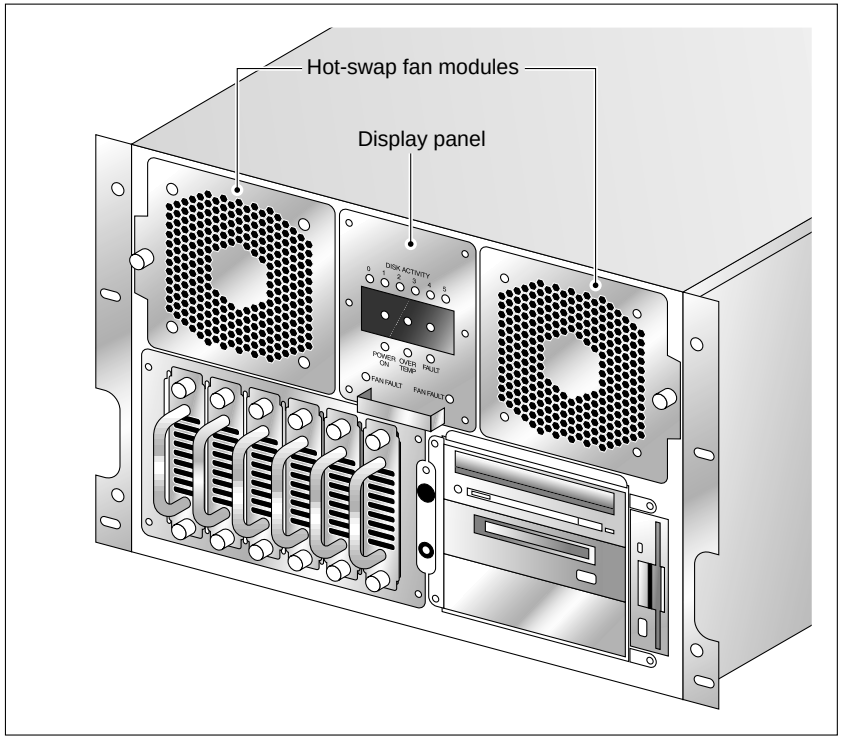
To hot-swap a cooling fan, follow these steps.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 21-6: Cooling fan



1 Remove the front bezel. Use the front display panel LED to locate the defective fan.

2 Loosen the thumbscrew located on the outside of the failed cooling fan module. If needed, use a flat-blade screwdriver.

3 Unseat the cooling fan module by sliding the module horizontally away from the display and toward the rack rail.

The module power connector unseats from the power connector located behind the display and LEDs.

4 Slide the failed cooling fan module out of the chassis.

5 Align the replacement cooling fan module tabs with the four support slots on the chassis. Be sure the module is oriented with the thumbscrew, and insert the tabs into the supporting slots of the chassis.

6 Slide the cooling fan module toward the front display panel and into position.

7 The fan module connects with slight resistance.

The module's LED lights green, and the fans rotate and pull air into the chassis.

8 Tighten the module's thumbscrew and replace the front bezel.

Replacing the power supply

When to replace a power supply

A green LED on the power supply and a green LED on the status display on the front panel indicate that the power supply is working properly.

A red LED on the power supply and a red LED on the status display on the front panel indicate that the power supply is not working properly.

Requirements

You will need the following items:

- antistatic wrist strap
- flat-blade screwdriver
- Phillips-head screwdriver
- the replacement power supply (3.3V output, 3 rail)

Hot-swapping a power supply

To hot-swap a power supply, follow these steps.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

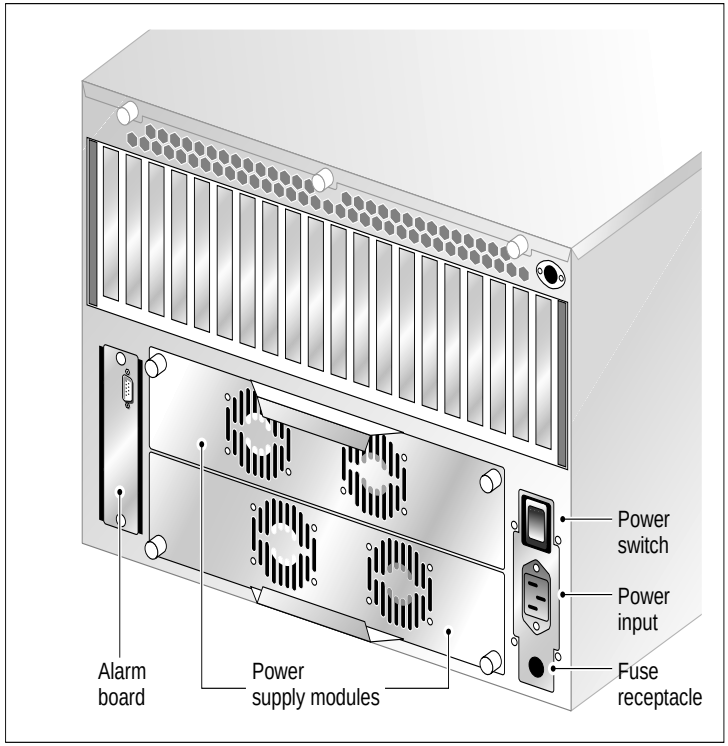
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

WARNING

Risk of service interruption

A power supply module is hot-swappable only if two power supplies are installed.

Figure 21-7: The power supply modules



1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 If only a single power supply is installed, then shut down and power off the server. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8 for more information.)

3 Loosen the thumbscrews at the right and left of the failed power supply module. If needed, use a flat-blade screwdriver. The thumbscrew must rotate freely and not contact the chassis threads.

4 Pull the power supply module free from the chassis using the molded horizontal handle on the power supply module.

5 Align the replacement module with the empty power supply bay.

6 Slide the replacement power supply module into the bay until the module is secured by its connector. Some force may be required.

7 Secure the power supply module to the chassis with two thumbscrews at the corners of the power supply faceplate.

8 If only a single power supply is installed, then power up the server.

9 The power supply LED illuminates green.

Replacing the fuse

Description

The fuse is located below the power input socket on the rear panel. When the server's fuse blows, the server will stop operating.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Requirements

- flat-blade screwdriver

- an approved fuse for replacement

  Note: There are two types of replacement fuses: one for North America and the other for international use. Ensure that the fuse you are replacing has been approved by Nortel.

Procedure for replacing the fuse

1. Shut down and then power down the server. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8 for more information.)
2. Unplug the power cable from the wall outlet.
3. Unplug the power cable from the power input socket on the server.
4. Unscrew the fuse receptacle.
5. Slide the fuse receptacle out of the fuse chamber.

   Note: Observe how the blown fuse is positioned in the receptacle.
6. Remove the blown fuse.
7. Install the approved fuse.
8. Slide the fuse receptacle back into its chamber.
9. Fasten the fuse receptacle with a flat-blade screwdriver.
10. Plug the power cable back into the power input socket on the server.
11. Plug the power cable into the wall outlet.
12. Power on the server.

Replacing the display panel and alarm board

When to replace the display panel or alarm board

The display panel and alarm board allow you to monitor and indicate the server status. When these are damaged, you should replace them immediately.

Requirements

You will need the following items:

- antistatic wrist strap
- Phillips-head screwdriver
- the replacement component(s)

Replacing the display panel

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power down the server. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8 for more information.)

3 Unplug the power cable from the wall outlet.

4 Remove the top cover and the front bezel from the chassis.

5 Put on an ESD wrist strap and attach it to an unpainted metal portion of the chassis.

6 Locate the display panel. It is located at the center front of the chassis, and is cabled to the rear of the chassis and the alarm board.

7 Loosen the four Phillips-head screws securing the display panel to the front of the chassis.

8 Disconnect the cable and lift the defective display up and out of the chassis.

9 Set the replacement display into position, and secure it to the chassis by tightening the thumbscrews.

10 Replace the top cover and front bezel.

11 If you are also replacing the alarm board, then go to “Replacing the alarm board” on page 21-41. If you are replacing only the display panel, then continue with the next step.

12 Plug the power cable into the wall outlet. Then power on the server.

Replacing the alarm board

1 Shut down and then power down the server. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8 for more information.)

2 Unplug the power cable from the wall outlet.

3 Loosen the two thumbscrews securing the faceplate at the left of the power supply modules.

4 Pull the carrier free from the chassis.

5 The alarm board is secured to the carrier by two Phillips-head screws. Remove the defective alarm board from the carrier.

6 Secure the replacement alarm board to the carrier using two Phillips-head screws.

7 Align the carrier with the chassis and slide the board into the chassis. The card will meet some resistance as it meets the connector.

8 Tighten the thumbscrews, securing the faceplate to the chassis.

9 Plug the power cable into the wall outlet. Then power on the server.

Chapter 22: Replacing or adding a hard disk or media drive

Overview

This chapter describes the steps for replacing or adding a hard disk or media drive (floppy, tape, or CD-ROM).

The procedures are grouped by server type in the following sections:

- "Section A: Tower AP (300tp) and MRS/AP (300tp)" on page 22-3
- "Section B: Tower AP (700tp), MRS/AP (700tp), and MRS/Tower" on page 22-16
- "Section C: Rack AP and MRS/Rack" on page 22-29

Also, for new hard disks, there is the following section that must be referred to after installing the new hard disk:

- "Section D: Configuring a new hard disk" on page 22-40

Number of supported hard disks

On all Release 4.0 servers and Release 2.x AP and MRS/AP servers, a maximum of two 4.5 Gbyte hard disks is supported.

On Release 2.x MRS servers, a maximum of four 1 Gbyte hard disks is supported.

Release 2.x hardware platforms

For instructions on replacing drives in Release 2.x hardware platforms, refer to the *Nortel IVR 2.0/S Installation and Maintenance Guide*. For instructions on adding a CD-ROM drive to Release 2.x AP or MRS/AP, see “Preparing for the upgrade of an AP or MRS/AP” on page 14-15. Adding a CD-ROM drive is part of the preparation for the software upgrade to Symposium OPEN IVR 4.0.

Section A: Tower AP (300tp) and MRS/AP (300tp)

Overview

This section describes how to replace or add a hard disk or media drive in a Tower AP (300tp) and MRS/AP (300tp).

Requirements

The following tools are required to perform the procedures in this section:

- Phillips-head screwdriver
- flat-blade screwdriver
- antistatic wrist strap
- container for screws and nuts
- labels
- pen or pencil

Approved hard disks

Only qualified drives may be used since subtle problems can crop up with untested types of drives. Drive selection can affect disk access times and power usage. Table 22-1 lists the qualified hard disks for a Tower AP and MRS/AP.

Table 22-1: Approved hard disks for the Tower AP and MRS/AP

Model	SCSI	Capacity
ST34573W	Wide	4.5 Gbyte

Note 1: The hard disk you use to replace a faulty hard disk must have the same or greater capacity than the faulty hard disk.

Note 2: For systems with Disk Mirroring, the replacement hard disk must be identical in performance, capacity, and type to the one being replaced (ideally the same model from the same manufacturer).

Replacing or adding a hard disk or media drive

The drive bay of the Tower AP and MRS/AP can house one tape drive, one CD-ROM drive, one floppy, and two hard disks. If two hard disks are installed, hard disk 2 must be removed before any other installed drive can be removed and replaced.

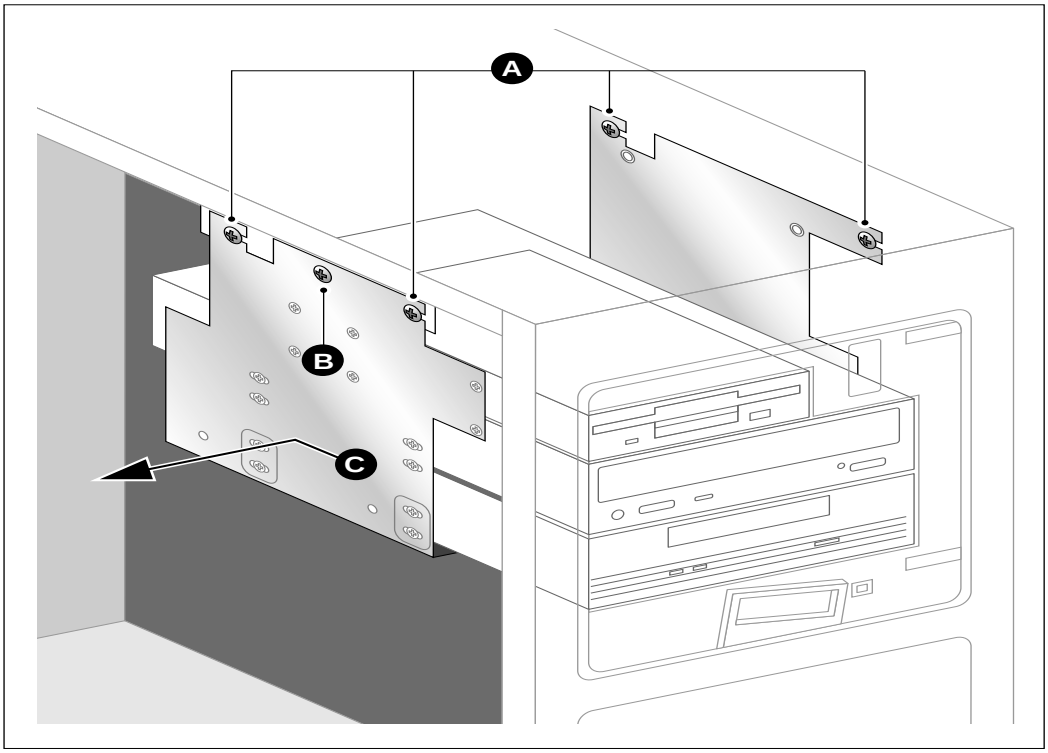
To replace or add a hard disk or media drive, perform the following steps which are described in this section:

- remove the drive bay from the chassis
- prepare the new drive (jumper settings)
- replace or adding a drive
- for hard disks, configure the new hard disk

Removing the drive bay from the chassis

The drive bay is accessible from the front of the Tower AP and MRS/AP. Figure 22-1 shows how to remove the drive bay. A detailed procedure follows the diagram.

Figure 22-1: Removing the drive bay from the Tower AP or MRS/AP



To remove the drive bay, follow the steps below:

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power off the server. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8.)

3 Unplug the AC power cord from the AC outlet.

4 Remove the chassis cover.

5 Locate the drive bay at the top front of the chassis.

6 Carefully loosen the four screws indicated by “A” in Figure 22-1 on page 22-5. These screws can be accessed through the space at the top left and top right of the exposed side of the drive bay.

7 Carefully loosen the screw indicated by “B” in Figure 22-1 on page 22-5.

Note: Do not remove the screws until all screws have been loosened, and the bay can be supported and removed without falling.

8 While supporting the drive bay, remove the screws and slide the bay slightly back towards the rear of the chassis.

9 Pull the drive bay free of the chassis and remove any connectors attached to installed devices.

Preparing the new drive (jumper settings)

Prior to installing the new drive, set jumpers and switches as described in this section.

WARNING

Risk of equipment damage

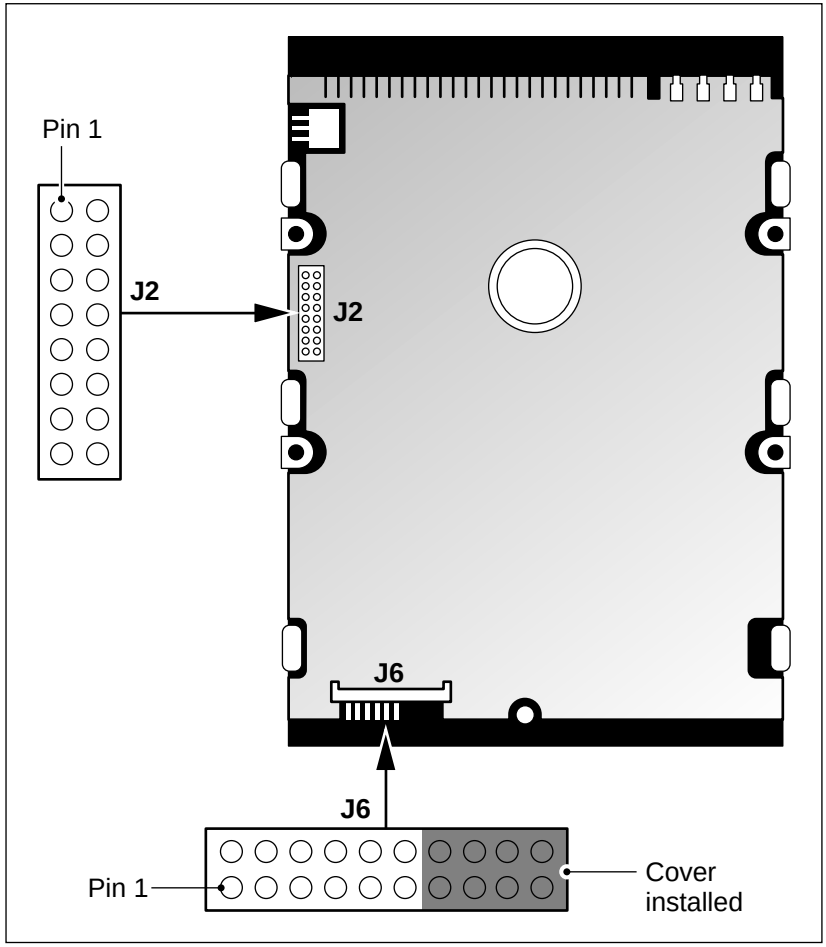
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Table 22-2: SCSI IDs and termination

Drive	Location	SCSI ID	Termination	Refer to
Hard disk 1	horizontal drive above the floppy drive	ID 0	DIsable	“Hard disk settings” on page 22-8
Hard disk 2	vertical drive on the right side of the drive bay	ID 1	Disable	“Hard disk settings” on page 22-8
Floppy drive	below hard disk 1	n/a	n/a	n/a
CD-ROM drive bay	below the floppy drive	ID 5	Disable	“CD-ROM settings” on page 22-10
Tape drive bay	below the CD-ROM	ID 2	Enable	“Tape drive settings” on page 22-10

Hard disk settings

Figure 22-2: Hard disk jumper locations



Note 1: J6 has a cover over pins 13 to 20. Keep the cover on J6.

Note 2: J1 at the rear of the drive is not used. All pins for J1 must be set to OFF.

Note 3: See Table 22-3 to Table 22-5 for J2 and J6 jumper settings.

Table 22-3: Hard disk J2 jumper settings for hard disks 1 and 2

Jumper position	15-16	13-14	11-12	9-10	(7)-8	5-6	3-4	1-2
Jumper label	NU	DS	ME	WP	PD	SS	NU	NU
Setting	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Table 22-4: Hard disk J6 jumper settings for Non-Disk Mirroring

	SCSI ID	All other pins	3-4	1-2
Hard disk 1	0	OFF	OFF	OFF
Hard disk 2	1	OFF	OFF	ON

Table 22-5: Hard disk J6 jumper settings for Disk Mirroring

	SCSI ID	All other pins	3-4	1-2
Hard disk 1	0	OFF	OFF	OFF
Hard disk 2	1	OFF	OFF	ON

CD-ROM settings

The jumper block is at the rear of the CD-ROM drive.

Table 22-6: CD-ROM jumper settings

Jumper position	S0	S1	S2	S3	S4	S5	S6	S7
Setting	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF

Tape drive settings

The jumper block is located at the rear of the tape drive. The dip switches are located on the underside of the tape drive.

Note: There is no physical pin at jumper position 7.

Table 22-7: Tape drive jumper settings

Jumper position	15-16	13-14	11-12	9-10	(7)-8	5-6	3-4	1-2
Setting	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF

Table 22-8: Tape drive switch settings

Switch position	S8	S7	S6	S5	S4	S3	S2	S1
Setting	OFF	OFF	OFF	ON	ON	OFF	ON	OFF

Replacing or adding a drive

Figures 22-3, 22-4, and 22-5 on the following pages show the location of the drives in the drive bay and how they are removed or installed. Use these diagrams to assist you.

Figure 22-3: Tape drive, CD-ROM, hard disk 1, and floppy drive locations

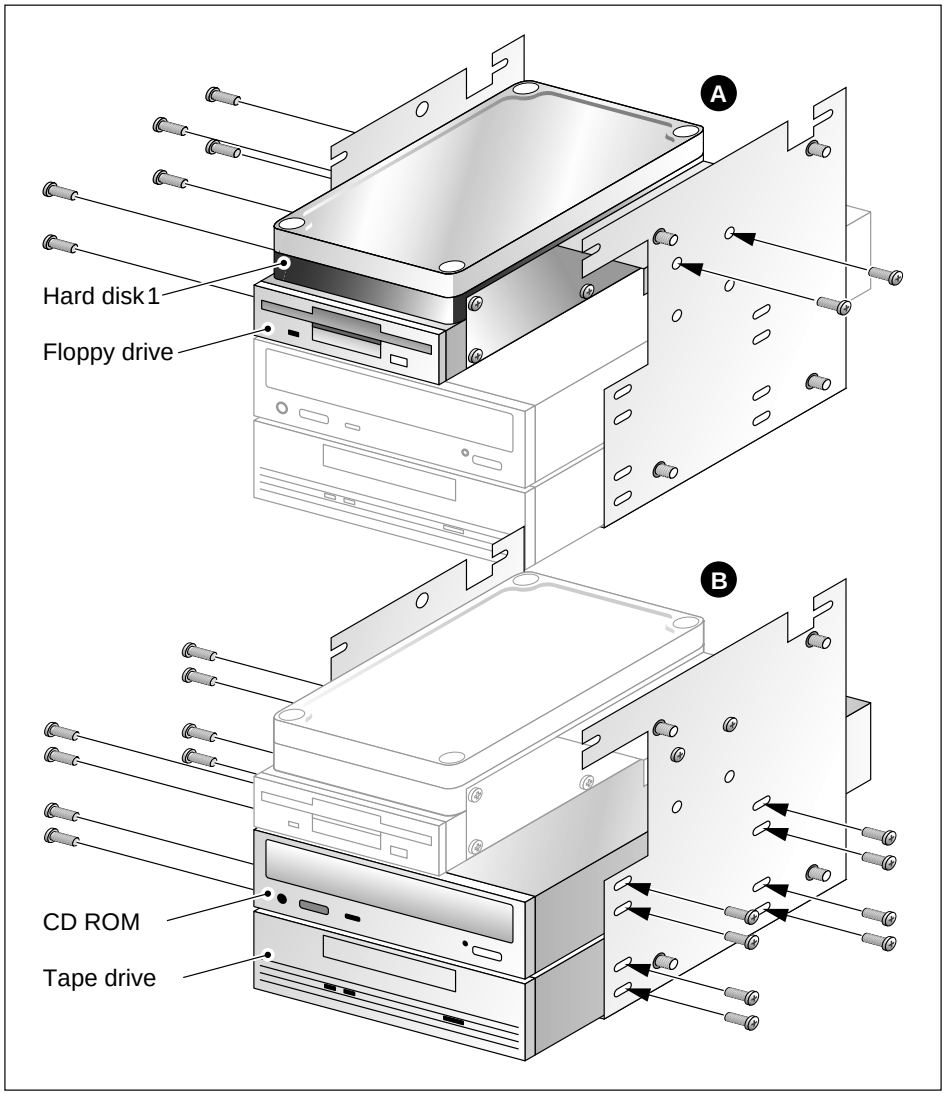


Figure 22-4: Floppy drive and hard disk 1 installation

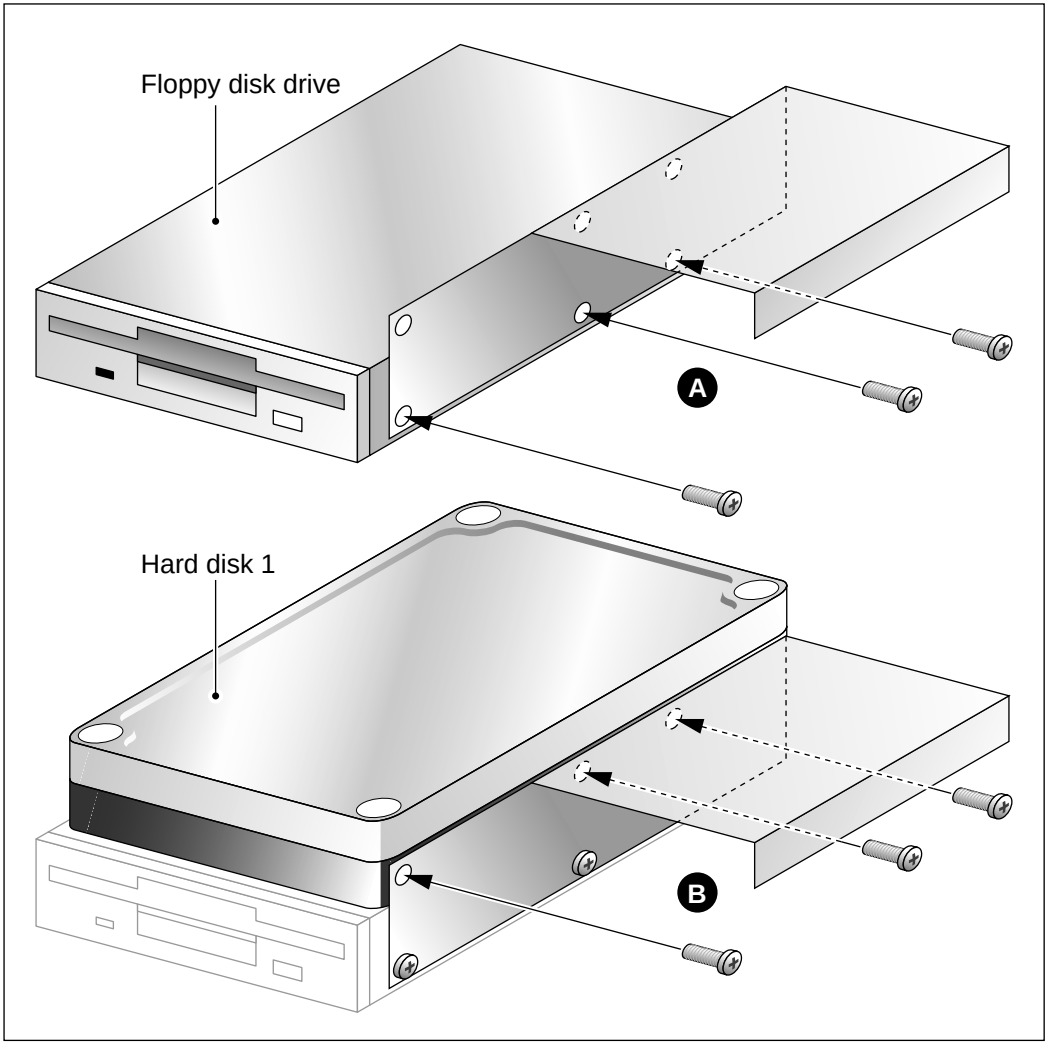
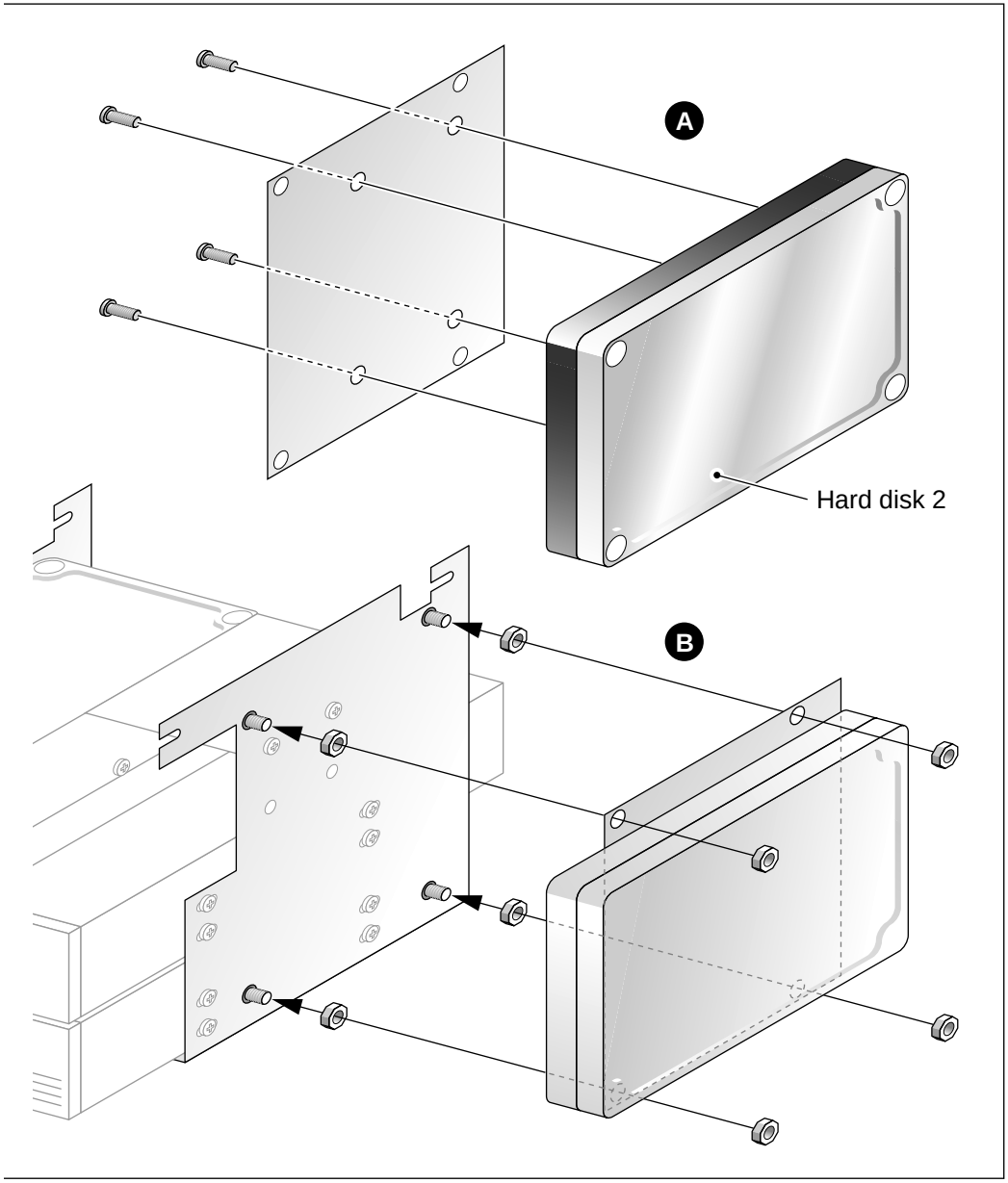


Figure 22-5: Hard disk 2 installation



Replacing or adding hard disk 2 (the vertical drive)

Refer to Figure 22-5 on page 22-13 and follow the steps below.

1 If you are replacing a faulty hard disk 2, remove the existing drive. To do this, remove the four nuts which secure the hard disk and its bracket to the drive bay. Part B of Figure 22-5 on page 22-13 shows the four nuts which must be removed.

2 Remove the faulty drive from its bracket.

3 Attach the new hard disk to a bracket using four screws as shown in part A of Figure 22-5 on page 22-13.

4 Attach the bracket side of the hard disk to the drive bay using four nuts to secure the hard disk, as shown in part B of Figure 22-5 on page 22-13.

Replacing hard disk 1 or the floppy drive

1 Temporarily remove hard disk 2 (the vertical hard disk) by removing the four nuts which secure the hard disk and its bracket to the drive bay. Part B of Figure 22-5 on page 22-13 shows the four nuts which must be removed.

2 The floppy drive and hard disk are attached to a bracket within the drive bay. Remove the screws which secure the floppy/hard disk bracket to the drive bay (see part A of Figure 22-3 on page 22-11).

3 Remove the floppy/hard disk bracket from the drive bay.

4 Remove the screws securing the faulty drive to the floppy drive bracket.

5 Attach the replacement drive to the floppy/hard disk bracket using the previously removed screws.

6 Reattach the floppy/hard disk bracket to the drive bay.

7 Reattach hard disk 2 to the drive bay.

Replacing the tape drive or CD-ROM

1 Temporarily remove hard disk 2 (the vertical hard disk) by removing the four nuts which secure the hard disk and its bracket to the drive bay. Part B of Figure 22-5 on page 22-13 shows the four nuts which must be removed.

2 Remove the screws on either side of the faulty media drive to remove it. See Part B of Figure 22-3 on page 22-11.

3 Insert the replacement media drive and secure it with the previously removed screws.

4 Reattach hard disk 2 to the drive bay.

Configuring a new hard disk

Do one of the following steps:

1 If you have replaced a faulty hard disk, restore the data onto the drive as described in Chapter 15, "Backup and failure recovery."

2 If you have added an additional hard disk for additional VSN storage, follow the instructions in "Section D: Configuring a new hard disk" on page 22-40.

Section B: Tower AP (700tp), MRS/AP (700tp), and MRS/Tower

Overview

This section describes how to replace or add a hard disk or media drive in a Tower AP (700tp), MRS/AP (700tp), and MRS/Tower.

Requirements

The following tools are required to perform the procedures in this section:

- Phillips-head screwdriver
- flat-blade screwdriver
- antistatic wrist strap
- container for screws and nuts
- labels
- pen or pencil

Approved hard disks

Only qualified drives may be used since subtle problems can crop up with untested types of drives. Drive selection can affect disk access times and power usage. Table 22-1 lists the qualified hard disks for a Tower AP (700tp), MRS/AP (700tp), and MRS/Tower.

Table 22-9: Approved hard disks

Model	SCSI	Capacity
ST34573W	Wide	4.5 Gbyte

Note 1: The hard disk you use to replace a faulty hard disk must have the same or greater capacity than the faulty hard disk.

Note 2: For systems with Disk Mirroring, the replacement hard disk must be identical in performance, capacity, and type to the one being replaced (ideally the same model from the same manufacturer).

Replacing or adding a hard disk or media drive

The hard disks and media drives (floppy, tape, CD-ROM) are installed onto a drive tray that can be removed from the chassis.

To replace or add a hard disk or media drive, perform the following steps which are described in this section:

- remove the drive tray from the chassis
- prepare the new drive (jumper settings)
- remove the floppy drive bracket from the drive tray
- replace a drive, or add a new drive to the drive tray
- reinstall the drive tray
- for hard disks, configure the new hard disk

Removing the drive tray from the chassis

The drive tray is accessible from the front of the server. Figure 22-6 shows the server with the drive tray sliding out. Note that the server must be placed on its side to perform this step. A detailed procedure follows the diagram.

DANGER

Risk of electric shock

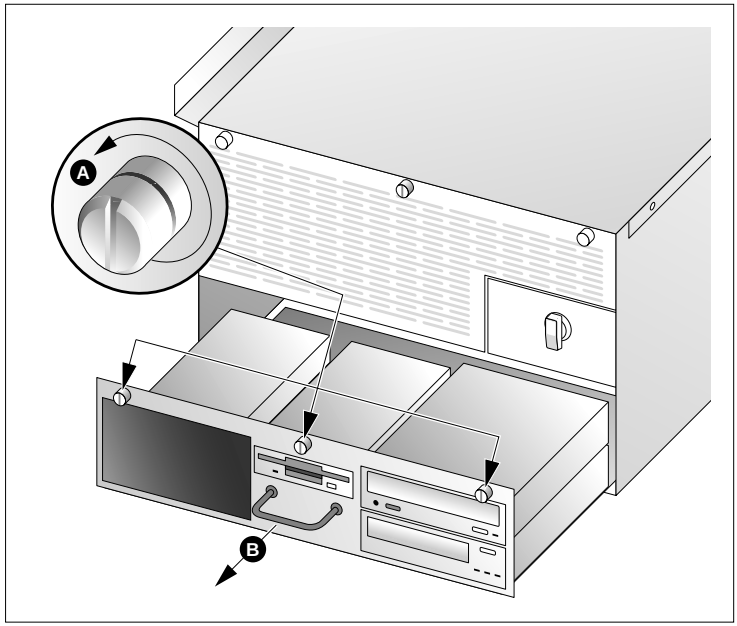
High current inside the chassis can cause severe injury.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 22-6: Removing the drive tray



To remove the drive tray, follow the steps below:

1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Shut down and then power off the server. (See “Shutting down the AP or MRS/AP” on page 2-7 or “Shutting down the MRS” on page 2-8.)

3 Unplug the AC power cord from the AC outlet.

4 Turn the server on its side so that the media drive tray is at the bottom (see Figure 22-6 on page 22-19).

5 Unscrew the three thumbscrews securing the drive tray.

The thumbscrews rotate freely after the threads are completely released.

6 Slide the tray out until the signal and power cables are exposed.

7 Disconnect and label signal cables.

8 Disconnect and label power cables.

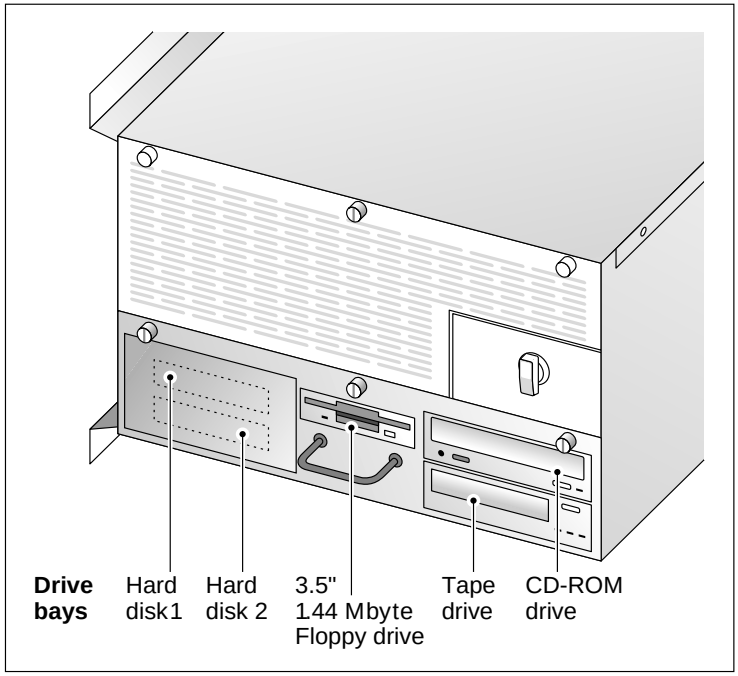
9 Release the two slide latches.

Note: One slide latch is located on the left rear edge of the tray, the other is on the right rear edge. The tray is released by sliding both slide latches inwards simultaneously.

10 Completely remove the drive tray from the chassis.

11 Make note of which drive is being replaced or added. Then continue with “Preparing the new drive (jumper settings)” on page 22-21.

Figure 22-7: Drive locations in the drive tray in the horizontal position



Preparing the new drive (jumper settings)

Prior to installing the new drive, set jumpers and switches as described in this section.

WARNING

Risk of equipment damage

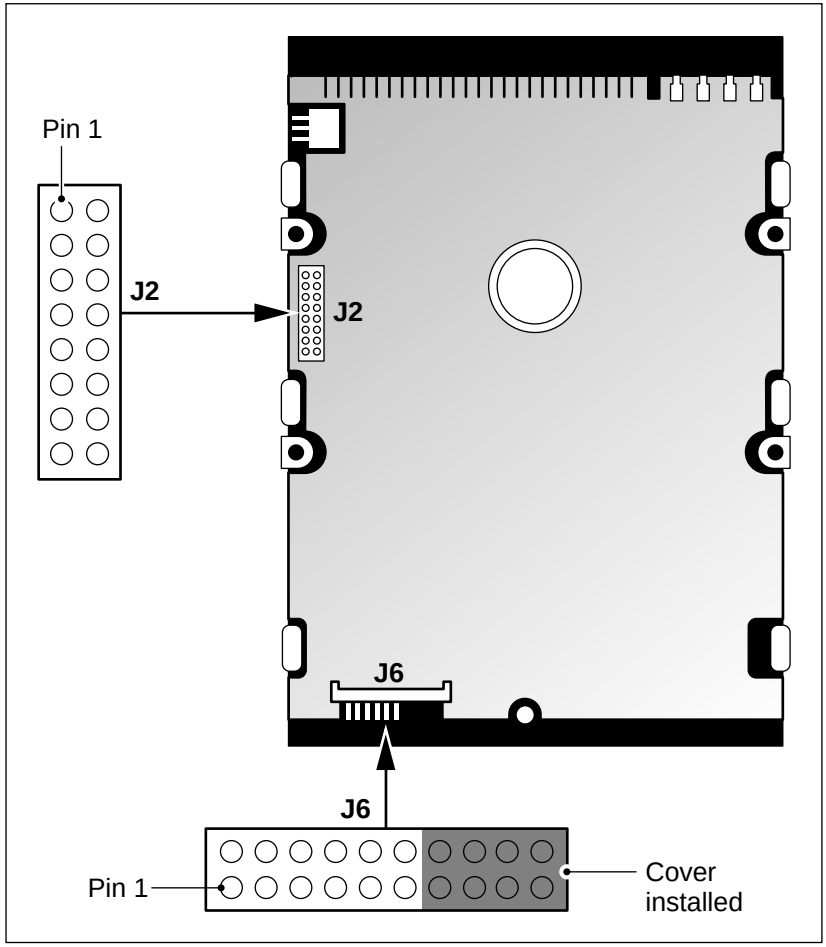
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Table 22-10: SCSI IDs and termination

Drive	SCSI ID	Termination	Refer to
Hard disk 1	ID 0	Enable	"Hard disk settings" on page 22-22
Hard disk 2	ID 1	Disable	"Hard disk settings" on page 22-22
Floppy drive	n/a	n/a	n/a
CD-ROM drive bay	ID 5	Disable	"CD-ROM settings" on page 22-24
Tape drive bay	ID 2	Disable	"Tape drive settings" on page 22-24

Hard disk settings

Figure 22-8: Hard disk jumper locations



Note 1: J6 has a cover over pins 13 to 20. Keep the cover on J6.

Note 2: J1 at the rear of the drive is not used. All pins for J1 must be set to OFF.

Note 3: See Table 22-11 to Table 22-13 for J2 and J6 jumper settings.

Note 4: If you are replacing or adding a hard disk, install the hard disk into a 5.25” bracket.

Table 22-11: Hard disk J2 jumper settings for hard disks 1 and 2

Jumper position	15-16	13-14	11-12	9-10	(7)-8	5-6	3-4	1-2
Jumper label	NU	DS	ME	WP	PD	SS	NU	NU
Hard disk 1	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
Hard disk 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Table 22-12: Hard disk J6 jumper settings for Non-Disk Mirroring

	SCSI ID	All other pins	3-4	1-2
Hard disk 1	0	OFF	OFF	OFF
Hard disk 2	1	OFF	OFF	ON

Table 22-13: Hard disk J6 jumper settings for Disk Mirroring

	SCSI ID	All other pins	3-4	1-2
Hard disk 1	0	OFF	OFF	OFF
Hard disk 2	1	OFF	OFF	ON

CD-ROM settings

The jumper block is at the rear of the CD-ROM drive.

Table 22-14: CD-ROM jumper settings

Jumper position	S0	S1	S2	S3	S4	S5	S6	S7
Setting	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF

Tape drive settings

The jumper block is located at the rear of the tape drive. The dip switches are located on the underside of the tape drive.

Note: There is no physical pin at jumper position 7.

Table 22-15: Tape drive jumper settings

Jumper position	15-16	13-14	11-12	9-10	(7)-8	5-6	3-4	1-2
Setting	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Table 22-16: Tape drive switch settings

Switch position	S8	S7	S6	S5	S4	S3	S2	S1
Setting	OFF	OFF	OFF	ON	ON	OFF	ON	OFF

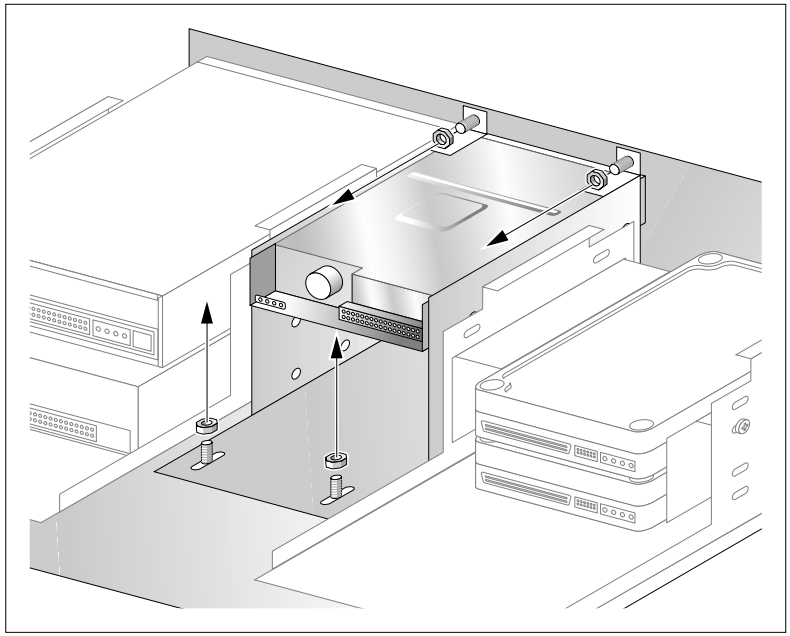
Removing the floppy drive bracket from the drive tray

Once the drive tray has been removed, the floppy drive bracket in the centre of the drive tray must be removed in order to access any of the drive bays.

1 Remove the four nuts securing the floppy drive bracket onto the drive tray.

Note: Save the nuts for later reinstallation.

Figure 22-9: Removing the floppy drive bracket



2 Slide the bracket assembly out of the drive tray.

3 Continue with one of the following procedures:

a “Replacing or adding hard disks 1 or 2, the tape drive, or CD-ROM” on page 22-26

b “Replacing the floppy drive” on page 22-26

Replacing or adding hard disks 1 or 2, the tape drive, or CD-ROM

This procedure applies to replacing or adding a hard disk in the left drive bays, or the tape drive or CD-ROM in the right drive bays. At this point, the drive tray has been removed from the chassis and the floppy drive bracket has been removed from the drive tray. The floppy drive bracket must be removed to access the other drive bays.

1. Locate the drive bay where you are either removing a faulty device, or adding another hard disk.
2. Remove the four screws on the hard disk or media drive bracket.

   Note: Save the screws you removed for securing a new device.
3. If you are replacing a faulty drive, slide the drive out of the bracket assembly.
4. Slide the new drive into the drive bay.
5. Secure the drive with four screws.
6. Do one of the following substeps:

   a If you are finished, go to “Reinstalling the drive tray” on page 22-27 to complete the installation.

   b If you are also replacing the floppy drive, continue with “Replacing the floppy drive” on page 22-26.’

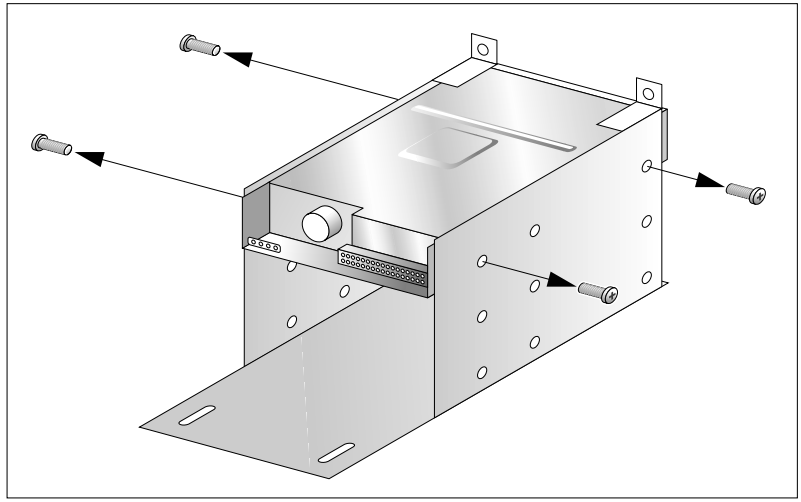
Replacing the floppy drive

This procedure applies to replacing the floppy drive. At this point, the drive tray has been removed from the chassis, and the floppy drive bracket has been removed from the drive tray.

1. Remove the two screws on either side of the floppy drive.

   Note: Save the screws you removed for securing a new device.

Figure 22-10: Removing the floppy drive from the floppy drive bracket



2 Remove the faulty drive out of the bracket assembly.

3 Insert the new drive into the drive bay.

4 Secure the drive with two screws on each side of the floppy drive bracket.

5 Go to “Reinstalling the drive tray” on page 22-27.

Reinstalling the drive tray

1 Reposition the floppy drive bracket in the centre of the drive tray.

2 Use the previously removed four nuts to secure the floppy drive bracket onto the drive tray. See Figure 22-9 on page 22-25.

3 Position the drive tray on the chassis frame, leaving enough room to reach behind and attach connectors. The chassis should still be on its side in a horizontal position.

4 Connect SCSI and power cables. The devices are attached to the SCSI cable in the following order, starting from the Wide SCSI connector on the SBC card:

- **a** SCSI tape drive (bottom drive in right bay)
- **b** SCSI CD-ROM (top drive in right bay)
- **c** Hard disk 2 (bottom drive in left bay)

d Hard disk 1 (top drive in left bay)

5 Remove labels identifying the cables.

6 Slide the media drive tray into the chassis. Ensure that cables are free and undamaged.

7 Secure the media drive tray to the chassis by fastening the three thumbscrews.

8 Stand up the chassis into its normal tower position.

Configuring a new hard disk

Do one of the following steps:

1 If you have replaced a faulty hard disk, restore the data onto the drive as described in Chapter 15, "Backup and failure recovery."

2 If you have added an additional hard disk for additional VSN storage, follow the instructions in "Section D: Configuring a new hard disk" on page 22-40.

Section C: Rack AP and MRS/Rack

Overview

This section describes how to replace or add a hard disk or media drive in an MRS/Rack.

Specific topics include:

- "Approved hard disks" on page 22-29
- "Adding or replacing a hard disk" on page 22-30
- "Configuring a new hard disk" on page 22-33
- "Replacing or adding a floppy drive, tape drive, or CD-ROM" on page 22-34

Approved hard disks

The following Seagate hard disks are approved:

Table 22-17: Approved hard disks for the Rack AP and MRS/Rack

Model	SCSI	Capacity
ST34573WC	Wide	4.5 Gbyte

Note 1: The hard disk you use to replace a faulty hard disk must have the same or greater capacity than the faulty hard disk.

Note 2: For systems with Disk Mirroring, the replacement hard disk must be identical in performance, capacity, and type to the one being replaced (ideally the same model from the same manufacturer).

Adding or replacing a hard disk

To replace or add a hard disk, perform the following steps which are described in this section:

- prepare the hard disk
- install the hard disk into the appropriate drive bay
- configure the new hard disk

Preparing the hard disk

Hard disk locations and assigned SCSI IDs

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Drive bays are filled in order from left to right. The left-most drive bay is referred to as drive bay 1 in this documentation.

The base system will have at least one hard disk (in drive bay 1). An additional drive can be added to drive bay 2.

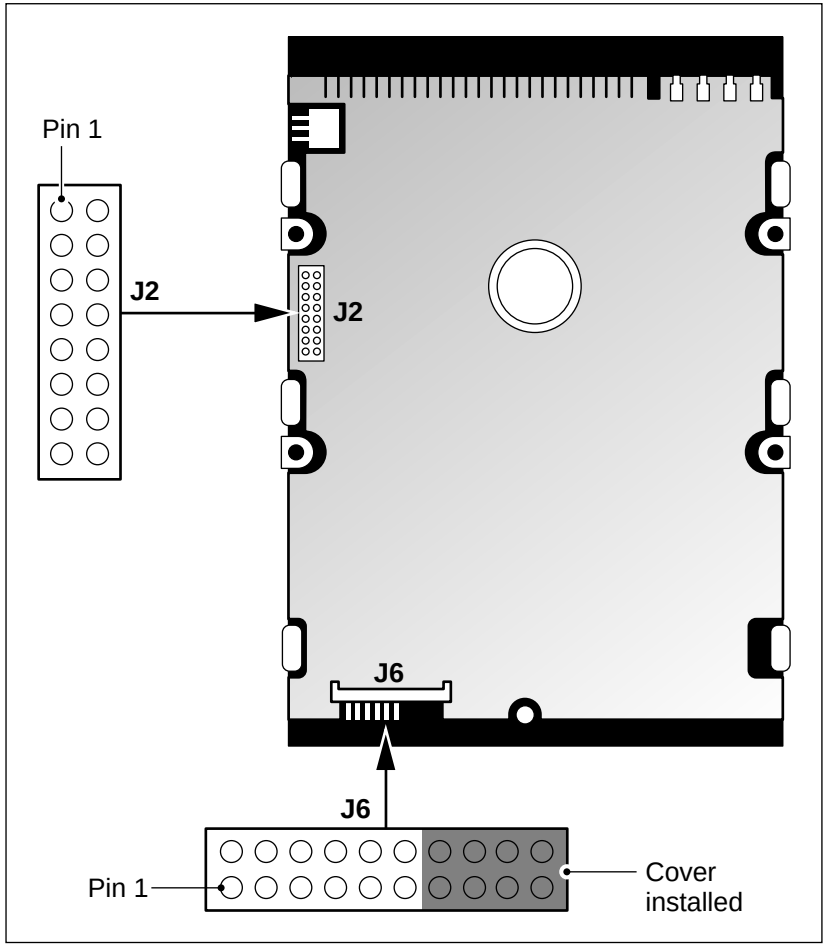
Table 22-18: Hard disk locations and assigned SCSI IDs

Hard disk	Location	SCSI ID (as configured in the SCSI backplane)
1	Drive bay 1	Channel 1, SCSI ID 0
2	Drive bay 2	Channel 1, SCSI ID 1

Note: SCSI IDs are configured in the SCSI backplane for this server and are not adjustable. The SCSI ID jumpers must be set to 0 on all hard disks (no jumpers) to allow the SCSI backplane to assign the SCSI ID.

Hard disk settings

Figure 22-11: Hard disk jumper locations



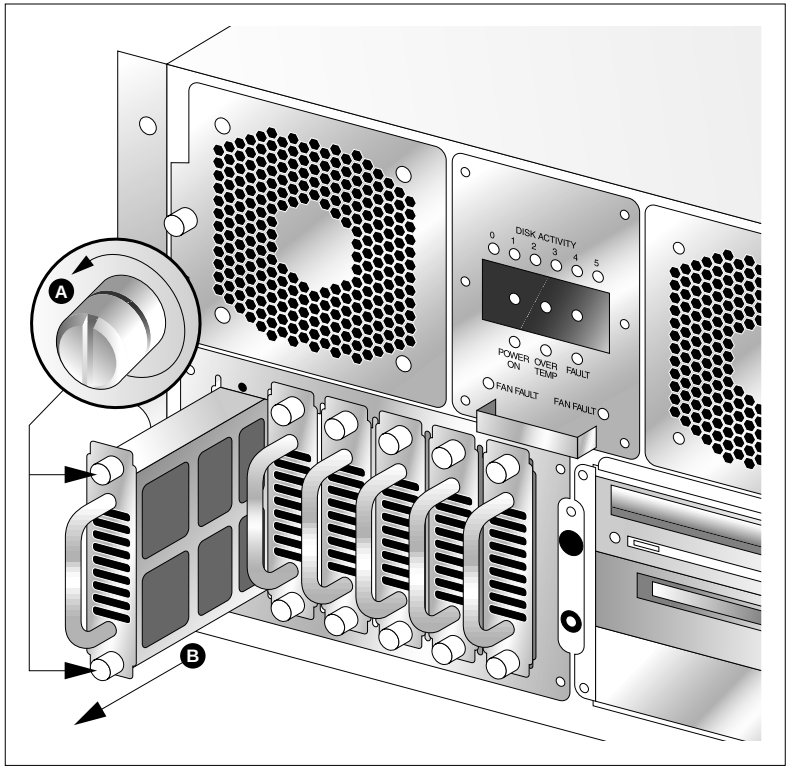
Note 1: J6 has a cover over pins 13 to 20. Keep the cover on J6.

Note 2: All pins for J2 and J6 must be set to OFF (no jumpers).

Installing the hard disk into the appropriate drive bay

Figure 22-12 shows the location of the hard disks.

Figure 22-12: Hard disk location



1 Ensure that you have performed a full backup of the server you are working on. See “Creating a system image backup” on page 15-4.

2 Remove the front bezel.

3 Locate the hard disks below the left cooling fan. See Figure 22-12 on page 22-32.

4 Do one of these steps:

a If you are replacing a hard disk, identify which drive bay contains the faulty drive.

b If you are adding a hard disk, identify which drive bay is the next available empty bay. Hard disks are installed in order from left to right. Hard disk 1 is in the left-most drive bay.

5 Loosen the thumbscrews on the selected drive bay.

6 Firmly grip the drive handle for the selected drive bay and slide the carrier out of the drive frame.

7 If you are replacing a faulty drive, remove the existing drive by loosening the four Phillips-head screws that secure it to the carrier. Then continue with the next step.

8 Attach the new drive to the carrier with four Phillips-head screws.

9 Align the carrier with the drive frame and slide it into the chassis. Expect resistance as the carrier and backplane connectors meet.

Note: When the connectors seat, the hard disk carrier faceplate is even with the chassis faceplate.

10 Secure the hard disk carrier by tightening the thumbscrews.

11 Replace the front bezel and lock it into place.

Configuring a new hard disk

Do one of the following steps:

1 If you have replaced a faulty hard disk, restore the data onto the drive as described in Chapter 15, "Backup and failure recovery."

2 If you have added an additional hard disk for additional VSN storage, follow the instructions in "Section D: Configuring a new hard disk" on page 22-40.

Replacing or adding a floppy drive, tape drive, or CD-ROM

To replace or add a media drive, perform the following steps which are described in this section:

- prepare the new media drive (jumper settings)
- remove the media drive bay from the chassis
- remove the media drive
- install the new drive

Requirements

- keys for the front bezel doors
- Phillips-head screwdriver
- antistatic wrist strap
- container for screws and nuts
- cable identification labels
- pen or pencil

Preparing the new media drive (jumper settings)

Prior to installing the new drive, set jumpers and switches as described in this section.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Table 22-19: SCSI IDs and termination

Drive	SCSI ID	Termination
Tape drive bay	ID 2	Disable
CD-ROM drive bay	ID 5	Disable
Floppy drive	n/a	n/a

CD-ROM settings

The jumper block is at the rear of the CD-ROM drive.

Table 22-20: CD-ROM jumper settings

Jumper position	S0	S1	S2	S3	S4	S5	S6	S7
Setting	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF

Tape drive settings

The jumper block is located at the rear of the tape drive. The dip switches are located on the underside of the tape drive.

Note: There is no physical pin at jumper position 7.

Table 22-21: Tape drive jumper settings

Jumper position	15-16	13-14	11-12	9-10	(7)-8	5-6	3-4	1-2
Setting	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Table 22-22: Tape drive switch settings

Switch position	S8	S7	S6	S5	S4	S3	S2	S1
Setting	OFF	OFF	OFF	ON	ON	OFF	ON	OFF

Removing the media drive bay from the chassis

You must remove the media drive bay from the chassis to replace a media drive. Follow the steps below.

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

CAUTION

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render cards damaged or unusable. Wear an ESD wrist strap.

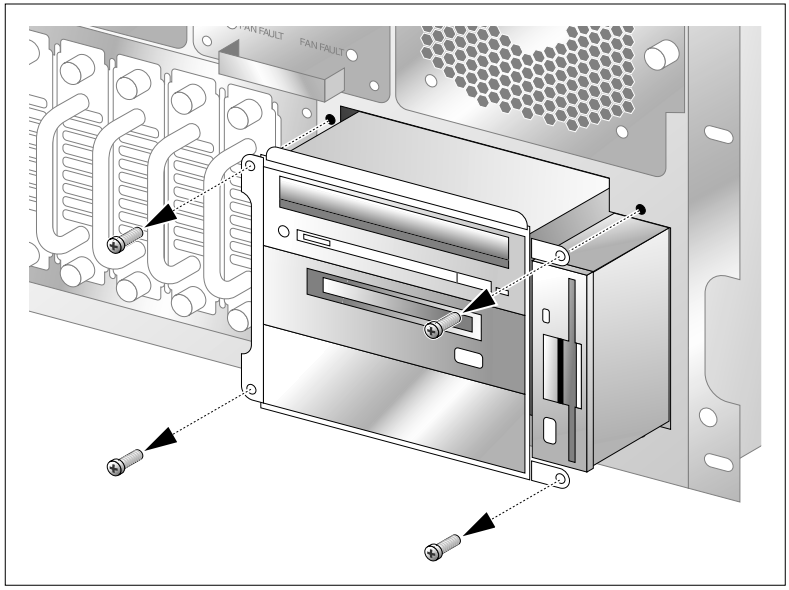
1 Shut down and then power off the MRS/Rack. (See “Shutting down the MRS” on page 2-8 for more information.)

2 Remove the front bezel from the chassis (see Chapter 21, “Replacing hardware components”).

3 Locate the media drive bay and loosen the four Phillips-head screws and washers securing the media drive bay to the chassis.

Note: Keep the screws and washers for reinstallation.

Figure 22-13: Removing the media drive bay



4 Holding cables away from the drive bay, pull the media drive bay away from the chassis until the connectors attached behind the media drives can be reached.

Note: Cables can easily be damaged during this procedure. Check that no cables are crossed when moving the carrier in and out of the drive bay.

5 Label and disconnect cables from installed media drives.

6 Finish removing the media drive bay from the chassis.

Removing the media drives

Media drives are secured to the media drive bay with four Phillips-head screws. You have to remove the floppy drive before you can remove the tape drive or the CD-ROM drive.

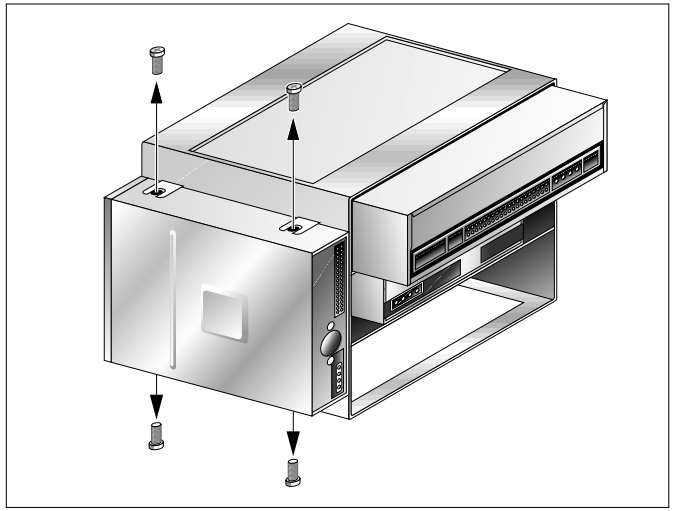
The procedure below begins with removing the floppy drive.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

Figure 22-14: Removing the floppy drive



1 Remove the floppy drive by loosening the four screws securing the drive, and slide it out of the carrier.

2 If you are replacing a faulty CD-ROM drive, locate the four screws securing the CD-ROM to the media drive bay and loosen them. Slide the CD-ROM out of the media drive bay.

3 If you are replacing a faulty tape drive, locate the four screws securing the tape drive to the media drive bay and loosen them. Slide the tape drive out of the media drive bay.

4 Continue with the steps in “Installing a new drive” on page 22-39.

Installing a new drive

The steps below describe how to install a new media drive.

WARNING

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

1 Slide the new drive into the media drive bay and secure it with four undercut Phillips-head screws.

2 Reattach the floppy drive if it was removed to access the tape drive or CD-ROM.

3 Align the media drive bay to the drive frame, leaving enough room to reach behind the media drive bay and attach the connectors.

4 Carefully connect the device and power cables, then slide the media drive bay into the chassis, checking that the cables are free and undamaged.

5 The tape drive requires an adapter in order to connect the narrow SCSI tape drive with a wide SCSI card cable.

6 Secure the media drive bay to the chassis with four Phillips-head screws.

7 Replace and lock the front bezel.

8 For the AC model, plug in the power cord.

9 Power up the MRS/Rack.

Section D: Configuring a new hard disk

Overview

This section describes how to configure a new additional drive on an AP, MRS/AP, or MRS.

To configure a new additional hard disk, follow these steps:

1 Partition the new hard disk (see “Format and partition the hard disk” on page 22-41).

2 Mount the new hard disk (see “Mounting additional hard disks” on page 22-45).

Creating VSN volumes

If you are configuring a hard disk for VSNs, note that a Symposium OPEN IVR 4.0 system can have up to four VSN volumes (vsnA, vsnB, vsnC, and vsnD). How these volumes are divided across the available hard disks will vary according to customer requirements.

Follow the procedures in this section. Additional steps for creating VSN volumes are included in the procedures in this section.

Format and partition the hard disk

1 Log in as `root` on the AP, MRS/AP, or MRS where the hard disk has been added.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 Enter one of the following commands:

- for hard disk 2, type **`fdisk -f /dev/rdsk/1s0`**
- for hard disk 3, type **`fdisk -f /dev/rdsk/2s0`**
- for hard disk 4, type **`fdisk -f /dev/rdsk/3s0`**

The following menu is displayed:

```
1. Display Partition Table
2. Use Entire Disk for UNIX
3. Use Rest of Disk for UNIX
4. Create UNIX Partition
5. Activate Partition
6. Delete Partition
```

3 Type **2** and press <Enter>.

A description of the current hard disk is displayed, followed by the following messages:

```
Warning! All data on your disk will be lost!
Do you wish to continue? (y/n)
```

4 Type **y** and press <Enter>.

5 Press <Enter> again to continue.

The menu is redisplayed.

6 Type **q** and press <Enter> to quit.

7 At the UNIX prompt, enter one of the following commands:

- for hard disk 2, type **`divvy -m /dev/rdsk/1s0`**
- for hard disk 3, type **`divvy -m /dev/rdsk/2s0`**
- for hard disk 4, type **`divvy -m /dev/rdsk/3s0`**

The following message is displayed:

```
Please enter the number of file systems you want
this area to be divided into, or press <Return> to
```

```
get the default of 1 file system(s)
```

Note: Depending on whether the new hard disk is a used drive or a new one, you may not receive the above prompt or the next prompt. If you do not receive these prompts, you need to manually create and edit the starting and ending blocks for divisions 0 and 1.

8 Type **1** and press <Enter>. Only one file system is supported on the new hard disk.

The following message is displayed:

```
The layout of the filesystems and swap area is now
prepared.
Do you wish to make any manual adjustments to the
sizes or names of the filesystems or swap area
before they are created on the hard disk? (y/n)
```

9 Type **y** and press <Enter>.

The following table and menu are displayed:

Name	Type	New FS	#	First Block	Last Block
	NOT USED	yes	0	0	4417056
	NOT USED	no	1	-	-
	NOT USED	no	2	-	-
	NOT USED	no	3	-	-
	NOT USED	no	4	-	-
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
1s0	WHOLE DISK	no	7	0	4417056

```
n[ame]    Name or rename a division.
c[reate]  Create a new filesystem on this division.
t[ype]    Select or change filesystem type on new filesystems.
p[revent] Prevent a new filesystem from being created on this division.
s[tart]   Start a division on a different block.
e[nd]     End a division on a different block.
r[estore] Restore the original division table.

Enter your choice or q to quit :
```

10 Type **n** to name a division and press <Enter>.

The following message is displayed:

```
which division? (0 through 7):
```

11 Type **0** for the first division and press <Enter>.

The following message is displayed:

```
what do you want to call it?
```

12 Type **u1** for hard disk 2, **u2** for hard disk 3, **u3** for hard disk 4 and press <Enter>.

13 The table is updated and the menu is redisplayed. The example here shows the first division named u1.

Name	Type	New FS	#	First Block	Last Block
u1	EAFS	no	0	0	4417056
	NOT USED	no	1	-	-
	NOT USED	no	2	-	-
	NOT USED	no	3	-	-
	NOT USED	no	4	-	-
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
1s0	WHOLE DISK	no	7	0	4417056

```
n[ame]    Name or rename a division.
c[reate]  Create a new filesystem on this division.
t[ype]    Select or change filesystem type on new filesystems.
p[revent] Prevent a new filesystem from being created on this division.
s[tart]   Start a division on a different block.
e[nd]     End a division on a different block.
r[estore] Restore the original division table.

Enter your choice or q to quit :
```

14 To create a file system on the division you just named, type **c** and press <Enter>.

The following message is displayed:

```
which division? (0 through 6):
```

15 Type **0** for the first division and press <Enter>.

The table is updated and the menu is redisplayed.

Name	Type	New FS	#	First Block	Last Block
u1	EAFS	yes	0	0	4417056
	NOT USED	no	1	-	-
	NOT USED	no	2	-	-
	NOT USED	no	3	-	-
	NOT USED	no	4	-	-
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
1s0	WHOLE DISK	no	7	0	4417056

```
n[ame]    Name or rename a division.
c[reate]  Create a new filesystem on this division.
t[ype]    Select or change filesystem type on new filesystems.
p[revent] Prevent a new filesystem from being created on this division.
s[tart]   Start a division on a different block.
e[nd]     End a division on a different block.
r[estore] Restore the original division table.

Enter your choice or q to quit :
```

16 Type **q** and press <Enter>.

The following menu is displayed:

```
i[nstall] Install the division set-up shown
r[eturn]  Return to the previous menu
e[xit]    Exit without installing a division table

Please enter your choice:
```

17 To install the new file system, type **i** and press <Enter>.

18 Type **init 6** and press <Enter> to reboot the system.

19 Continue with “Mounting additional hard disks” on page 22-45.

Mounting additional hard disks

For the file system on the secondary disks to mount automatically at start-up, you must add an entry to the /etc/default/filesys file. Use the procedure in this section to add the /etc/default/filesys file entry.

The naming convention for file systems used in this section and in the procedure that follows is:

- **u1** identifies the file system on hard disk 2
- **u2** identifies the file system on hard disk 3
- **u3** identifies the file system on hard disk 4

Adding an entry to the /etc/default/filesys file

1 Log in as root on the AP, MRS/AP, or MRS where the hard disk has been added.

Note: On an MRS, obtain a UNIX shell after logging in. At the /sci prompt, type **maint shell** and press <Enter>.

2 Type **cd /** and press <Enter> to change to the root directory.

3 Type **ls** and press <Enter>

4 If the directories u1, u2, or u3 do not exist, create the required directory, as follows:

- **a** for hard disk 2, type **mkdir u1** and press <Enter>
- **b** for hard disk 3, type **mkdir u2** and press <Enter>
- **c** for hard disk 4, type **mkdir u3** and press <Enter>

5 To create VSN volumes for the new hard disk (for a hard disk on an MRS or MRS/AP), do the following substeps:

- **a** Navigate to the directory you just created for the new hard disk. For example, for hard disk 2, type **cd /u1**.

b Create subdirectories for new VSN volumes, using the following naming convention:

- vsnA - first VSN volume (type **`mkdir vsnA`**)
- vsnB - second VSN volume (type **`mkdir vsnB`**)
- vsnC - third VSN volume (type **`mkdir vsnC`**)
- vsnD - fourth VSN volume (type **`mkdir vsnD`**)

6 Type **`cd /etc/default`** at the prompt and press <Enter>.

7 Type **`vi filesys`** and press <Enter> to open the file named `filesys`.

8 Add the lines for the new file system by removing the comment code (#). For example, to add hard disk 2 (u1), remove the comment code from the following lines:

```
#bdev=/dev/u1 cdev=/dev/ru1 \
#       mountdir=/u1 mount=no fstyp=HTFS \
#       fsck=dirty  fsckflags=  rcmount=yes \
#       rcfsck=dirty  mountflags =
```

Also ensure that the comment code (#) is removed from VSN Volume Configuration lines at the end of the `filesys` file. These VSN volume configurations are used if you add VSN volumes. Otherwise, they do not affect the hard disk configuration.

9 Save the file and exit vi editor. Type **`wq`** and press <Enter>.

10 You must reboot the system for the changes to be recognized by the system. Type **`shutdown -y -g0 -i6`** at the prompt and press <Enter>.

11 Log in as `root` on the AP, MRS/AP, or MRS where the hard disk has been added.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

12 Type **`df -v`** at the prompt and press <Enter> to check if the additional file system has been mounted.

13 If you have created VSN volumes, continue with “Clearing the VSN volume” on page 22-47.

Clearing the VSN volume

After VSN volumes are created, they must be cleared.

1 Log in to the MRS or MRS/AP as `service` or `root`.

2 At the `/sci` prompt, type **`files vsn`** and press <Enter>.

The following prompt is displayed:

```
/sci/files/vsn>
```

3 Type **`clear`** and press <Enter>.

The following prompt is displayed:

```
Default Volume id to clear = 1
Volume id to clear =
```

4 Enter a number to identify the vsn volume you have just created, as follows:

a Type **`1`** to clear vsnA.

b Type **`2`** to clear vsnB.

c Type **`3`** to clear vsnC.

d Type **`4`** to clear vsnD.

The following prompt is displayed:

```
Ready to Format Volume n
Are you sure you wish to clear this volume?
Current continue? = yes
yes                    - Continue with operation.
no                     - Return to previous menu.
                       continue? =
```

5 Type **`yes`** and press <Enter> to continue.

The following prompt is displayed:

```
VSN Volume Cleared Successfully
```

6 Repeat this procedure for each new VSN volume.

7 Type **done** and press <Enter> until you are back at the `/sci` prompt.

Chapter 23: Troubleshooting

Overview

The Symposium OPEN IVR system includes several diagnostic facilities for troubleshooting your system. This chapter discusses:

- "Troubleshooting checklists" on page 23-1
- "System verification" on page 23-10
- "Boot-up (POST) diagnostics" on page 23-10
- "Viewing the alarm log" on page 23-12
- "Verifying resource availability (Advisory log)" on page 23-12
- "Solving system-wide problems" on page 23-15
- "Gathering call statistics" on page 23-23
- "Isolating a channel fault" on page 23-25
- "DOS-based diagnostics and PC Diags" on page 23-35
- "Telco card diagnostics" on page 23-36
- "SCSISelect utility" on page 23-39
- "Debugging trunk type files" on page 23-39
- "Description of IVR tools" on page 23-40

Troubleshooting checklists

This section contains a description of specific problems and steps to resolve those problems. If these procedures are not applicable to your system problem, try one of the other diagnostic tools discussed in this chapter.

Disk Mirroring errors occur

1 If Disk Mirroring errors occur, follow the procedures in “Section E: Disk mirroring failure recovery” on page 15-32.

CD-ROM stuck in the drive

1 If the CD-ROM appears stuck in the drive, type **`umount /mnt`** and press <Enter>. Then remove the CD-ROM.

NTTEST plays “two” then hangs up

1 Stop and unload NTTEST.

2 Use the Prompt Loading Facility to load NTTEST prompts 400-499.

3 Load and run NTTEST again.

NTTEST application and option cards not working

1 Review the error codes (refer to the *Symposium OPEN IVR Error Messages Guide*).

2 Ensure the option being tested is enabled (refer to the appropriate option guide).

3 Verify that the option has been purchased and activated in the License file. Type **`vlm_options`** at the root prompt to check licensed options.

4 Check jumper or switch settings on the cards (refer to the appropriate option guide).

5 Perform a firmware download on the MRS using the `/sci/maint>download` option.

6 If this is a PEB-based system, verify the card location on the PEB bus. Refer to the *Planning and Engineering Guide*.

Communication problems between the MRS and AP

1 Verify that the AP and MRS are connected to the LAN via a LAN cable and card.

2 Check that the System Configuration is set correctly for each MRS. Refer to the *System Administration Guide* for details.

3 Ensure that the IP address and subnet mask and other network configuration settings are correct. See Chapter 13, "Host name and IP address change."

4 Check the host files on each server to ensure that they contain the correct host names and IP addresses. See Chapter 13, "Host name and IP address change."

5 Verify with the LAN administrator that the IP addresses and host names are unique.

6 If the Advisory log appears in the Error log, then the MRS and AP are communicating (see "Verifying resource availability (Advisory log)" on page 23-12).

R2 MRS server has flashing green Ready light

1 Verify that there is no floppy diskette in the floppy drive (remove it if there is one).

2 At the `/sci` prompt, type **`log`** and look for the Advisory log (see "Verifying resource availability (Advisory log)" on page 23-12 for an example).

3 If there is no Advisory log after the most recent reset or reboot, then the AP and MRS are not communicating. See the steps in "Communication problems between the MRS and AP" on page 23-2.

4 Use the `/sci/maint>restart` to reboot the MRS.

5 When the MRS reboot is complete, reboot the AP. At the root prompt, type **`shutdown -y -g0`**.

Analog ports not logging in to the queue

1. Verify cabling between the MRS and PBX.
2. Ensure the Analog cards are enabled in ID 32.
3. Determine the number of analog ports and ensure each Trunk Group is assigned a Trunk Type file on the MRS. Use the `/sci/config>list` option to check.

   The following is an example from a PEB-based system:

```
/sci/config>  list
       SYSTEM INFORMATION
        Sysgen File Version =  3.00
        Sample Rate = 32k
        Application Processor Link = auto
       A.P. Link Com Port Used = /dev/tty2a
       A.P. Link Failure Mode = busyout

       RECOGNIZER INFORMATION
       BOARD NUMBER = 1
       Board Type   = vr160-1
       Board Status = enabled
       PEB number   = 0
       Encoding     = Mu_Law

       SP #  Model  # of Recog  Position   Type  Status  Vocab
       1     VRM/40     4          1 -  4     disc   enabled   naengstd
       VOLUME INFORMATION
       VOLUME 1    Total Capacity = 444.0MB
       VOLUME 2    Total Capacity = 444.0MB
       VOLUME 3    Not Formatted or Not Present
       VOLUME 4    Not Formatted or Not Present

       <<<<< TRUNK INFORMATION >>>>>
       TRUNK GROUP   1   Channels  0 to  3   PEB 0   ACD0   mu-law
       TRUNK GROUP   2   Channels  4 to  7   PEB 0    ACD1   mu-law
       TRUNK GROUP   3    Channels  8 to 11    PEB 0    ACD2    mu-law

       FAX INFORMATION
       FAX BOARD NUMBER = 1  Status = enabled  PEB 0    mu-law
       PORT  1    Image Width: a4width Length: unlimited Resolution:
dpi200
       PORT  2    Image Width: a4width Length: unlimited Resolution:
```

```
dpi200

       TEXT-TO-SPEECH INFORMATION
       TTS BOARD NUMBER = 1
       TTS Board Type = antares
       TTS base IO address  = 0x210
       Number of ports = 4
       PEB number = 0
       Data encoding = Mu_Law
       DSP 1    enabled     english
       DSP  2    enabled      english
       DSP  3    enabled      english
       DSP  4    enabled      english


       RECOGNIZER INFORMATION
       BOARD NUMBER = 1
       Board Type   = vr160-1
       Board Status = enabled
       PEB number   = 0
       Encoding     = Mu_Law

       DSP #  Model  # of Recog  Position   Type  Status  Vocab
       1     VRM/40     4          1 -  4     disc   enabled   naengstd
```

4 Run NTTEST (see “Loading and using NTTEST” on page 24-12).

T1 Ports not logging in to the Queue

1. Verify cabling between the MRS and PBX.
2. Ensure the T1 cards are enabled in ID 32.
3. Determine the number of T1 ports and ensure each Trunk Group is assigned a Trunk Type file on the MRS. Use the `/sci/config>list` option to check.

   The following is an example from a PEB-based system:

```
/sci/config>  list
       SYSTEM INFORMATION
        Sysgen File Version =  3.00
        Sample Rate = 32k
        Application Processor Link = auto
       A.P. Link Com Port Used = /dev/tty2a
       A.P. Link Failure Mode = busyout

       RECOGNIZER INFORMATION
       BOARD NUMBER = 1
       Board Type   = vr160-1
       Board Status = enabled
       PEB number   = 0
       Encoding     = Mu_Law

       SP #   Model   # of Recog   Position    Type   Status   Vocab
       1     VRM/40     4          1 -  4     disc   enabled   naengstd
       VOLUME INFORMATION
       VOLUME 1    Total Capacity = 444.0MB
        VOLUME 2    Total Capacity = 444.0MB
       VOLUME 3    Not Formatted or Not Present
       VOLUME 4    Not Formatted or Not Present

       <<<<< TRUNK INFORMATION >>>>>
       TRUNK GROUP   1 Channels  0 to 3      PEB 0    NT1-ACD0    mu-law
       TRUNK GROUP   2 Channels  4 to 7     PEB 0    NT1-ACD1mu-law
       TRUNK GROUP   3 Channels  8 to 11   PEB 0   NT1-ACD2   mu-law

       FAX INFORMATION
       FAX BOARD NUMBER = 1  Status = enabled  PEB 0    mu-law
       PORT  1    Image Width: a4width Length: unlimited Resolution:
dpi200
       PORT  2    Image Width: a4width Length: unlimited Resolution:
```

```
dpi200

       TEXT-TO-SPEECH INFORMATION
       TTS BOARD NUMBER = 1
       TTS Board Type = antares
       TTS base IO address  = 0x210
       Number of ports = 4
       PEB number = 0
       Data encoding = Mu_Law
       DSP 1    enabled     english
       DSP  2    enabled      english
       DSP  3    enabled      english
       DSP  4    enabled      english
       RECOGNIZER INFORMATION
       BOARD NUMBER = 1
       Board Type   = vr160-1
       Board Status = enabled
       PEB number   = 0
       Encoding     = Mu_Law
       DSP #   Model   # of Recog   Position    Type   Status   Vocab
       1     VRM/40     4          1 -  4     disc   enabled   naengstd
```

4 Run NTTEST (see “Loading and using NTTEST” on page 24-12).

Mouse not working correctly

1 Move the mouse around and locate the cursor. If the mouse does not respond, continue to move the mouse for about 10 seconds. If the mouse still does not respond, then continue with the next step.

2 Check the process for the mouse. In an Xterm window, enter:

```
ps -le | grep mwm
```

The following lines appear:

```
F  S   UID   PID   PPID  C PRI NI  ADDR1  ADDR2  SZ    WCHAN    TTY   TIME CMD
20 S   200  3996  3982  0  26 24   a83      a97    696   f010bc48 ?     0:02 mwm
```

3 Restart the XWindows screen using the following command:

```
kill -16 PID
```

where `PID` is the Process ID from step 2.

MRS will not Boot – Ethernet Card not configured correctly

1. Verify that configured cards have the correct IRQ settings (refer to the *Planning and Engineering Guide).*
2. If the LAN card is found to have the incorrect IRQ, then continue with the remaining steps in this procedure.
3. Check that you have an Emergency Boot disk, or build a bootable disk from another MRS (see “Creating an emergency boot diskette” on page 23-10).
4. Ensure that a console is connected to the VGA port on the MRS.
5. Reboot the down MRS with the boot disk.
6. Type the following at the `Boot:` prompt:

   `fd(64)unix root=hd(40)`

   This will boot from the floppy drive and read the kernel from the hard drive.

   or

   `fd(40)unix root(64`)

   This boots from the hard drive and reads the kernel from the floppy drive.
7. Log in to the MRS as `root`.
8. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
9. At the # prompt, type **`mountall`** and press <Enter>.
10. Reconfigure the LAN card by following the procedure in “Replacing a LAN card” on page 17-14.
11. Reboot the MRS.

Hard disk is 100% full

1. Check that you have an Emergency Boot disk, or build a bootable disk from another MRS (see “Creating an emergency boot diskette” on page 23-10).
2. Ensure that a monitor is connected to the VGA port on the MRS.
3. Reboot the down MRS with the boot disk.
4. Type the following at the `Boot:` prompt:

   `fd(64)unix root=hd(40)`

   This will boot from the floppy drive and read the kernel from the hard drive.

   or

   `fd(40)unix root(64`)

   This boots from the hard drive and reads the kernel from the floppy drive.
5. Log in to the MRS as `root`.
6. At the `/sci` prompt, type **`maint shell`** and press <Enter>.
7. At the # prompt, type **`mountall`** and press <Enter>.
8. At the # prompt, type **`df –v`** and press <Enter>.
9. Determine which file system is at the 100% capacity.
10. At the # prompt, type **`cd /`** and press <Enter>.
11. At the # prompt, type **`du`** and press <Enter>.
12. Determine which file is larger than its original size.
13. Determine the size of the file or files that are causing the hard disk to be at maximum capacity, and move those files to a different file system or delete those files.
14. Check the capacity after each move or deletion until the hard disk is no longer full.
15. When done, type **`shutdown -y -g0 -i6`** and press <Enter>.

System is sluggish or memory-related errors occurring

1 Close open windows to reduce memory consumption.

System verification

Two applications are part of the base Symposium OPEN IVR system to be used for system verification.

The NTTEST_MN application is designed to test the basic functionality of the system and its options. Refer to Chapter 24, "Verification test (NTTEST)" for instructions.

Similarly, NTTEST_WEB application is designed to test the basic functionality of the web option on the system. Refer to Chapter 24, "Verification test (NTTEST)" for instructions.

Boot-up (POST) diagnostics

The Power-On Self-Test (POST) is a system diagnostic program (stored in the BIOS) that runs every time the AP, MRS, or MRS/AP is rebooted. Its function is to test system components, then display status messages or sound beep codes.

Refer to the *Symposium OPEN IVR Error Messages Guide* for details.

Creating an emergency boot diskette

An emergency boot diskette is provided with a new system or with an upgrade package. If this diskette is not available, you can create one by logging into another server.

1 To create a boot diskette, log in to another server as `root`.

Note 1: For Release 2.x MRS, log in to another Release 2.x MRS to create a boot diskette.

Note 2: For Release 2.x AP or MRS/AP and all Release 4.0 servers, you can log in to any other Release 2.x AP or MRS/AP and all Release 4.0 servers to create a boot diskette.

Note 3: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 At the # prompt, type **`mkdev fd`** and press <Enter>.

3 From the menu, choose **2** for the emergency boot or root diskette option.

4 Choose **2** to select the 1.44 Mbyte floppy.

5 Choose **2** to create an emergency boot diskette.

6 Choose **2** for the generic emergency boot diskette.

A prompt is displayed asking if you want to format the floppy disk.

7 Type **y** and press <Enter>.

The system proceeds to format the diskette and then create the boot diskette.

License file errors

During the license file installation, the system creates a backup of the current license file before installing the new file. The backup license file uses the following naming convention:

MMDDYYHHMMSS, where MM - month, DD - date, YY - year, MM - minute and SS - second.

The time stamp is taken from the appropriate hosts.

If a new license file causes system problems, revert to the backup of the previous license file, as follows:

1 Log in as `root` on the affected server.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

2 At the # prompt, type **`cd \usr\vrs\vlmsw`** and press <Enter>.

3 Type **`mv license.`*`mmddyyhhmmss`*` license.dat`** and press <Enter>.

4 When done, type **`shutdown -y -g0 -i6`** and press <Enter>.

5 Contact your distributor and report the problem.

Viewing the alarm log

While you are using the MRS, an alarm may be turned on as noted by the alarm indicators on the front panel of the MRS (or your external alarm system when connected). A good source of information for analyzing what has happened is the alarm log. This log lists all alarm events that have occurred, sorted by time, starting with the oldest.

To view the alarms log, follow these steps.

1. Log in to the MRS as `service`.
2. At the `/sci` prompt, type **`status alarmlog`** and press <Enter>.

Verifying resource availability (Advisory log)

Whenever option cards (Speech Recognition, Fax cards, and so on) are installed into the MRS/Tower or MRS/Rack, after the configuration is complete, the Advisory log provides an excellent troubleshooting tool to verify that the resource is available.

To view the advisory log, follow these steps.

1. Log in to the MRS as `service`.
2. At the `/sci` prompt, type **`log`** and press <Enter>.
3. Type a **$** to view the end of the log.
4. Look for an entry similar to the example in Figure 23-1 for SCbus systems or Figure 23-2 for PEB systems. This Advisory log provides information on what resources are available.

The information in the Advisory line after the `F0`, `F2`, or `F3` and before the `DD` can be broken down into groups of four characters that provide information on a specific resource. The Advisory log entry can be broken down as shown in the example in Figure 23-1 for SCbus systems or Figure 23-2 for PEB systems.

If an entry does not show up in the log entry, some of the possible problems could be the following:

1. The card has the wrong settings.
2. The system has not been Reset.

Figure 23-1: Sample Advisory log on an SCbus-based system

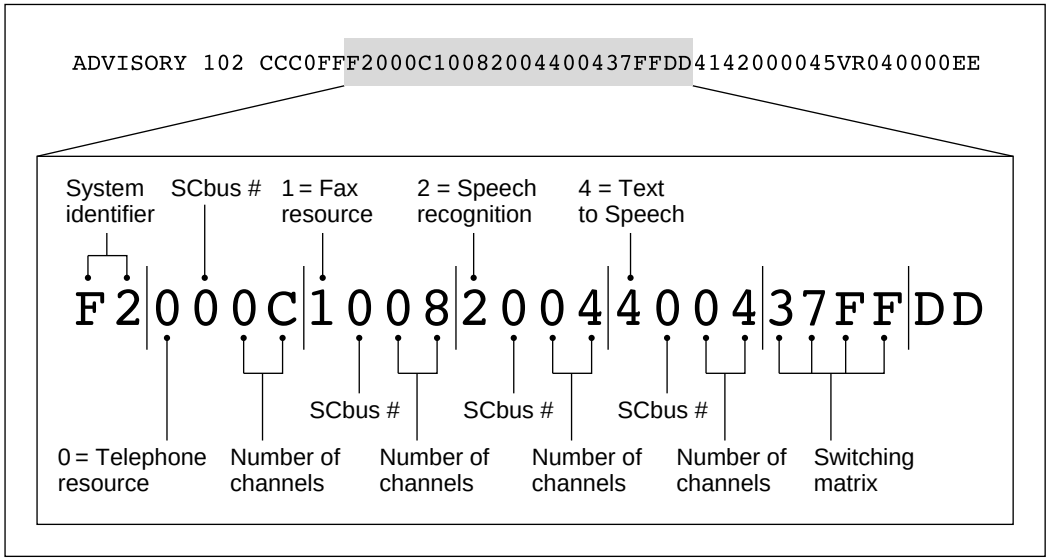
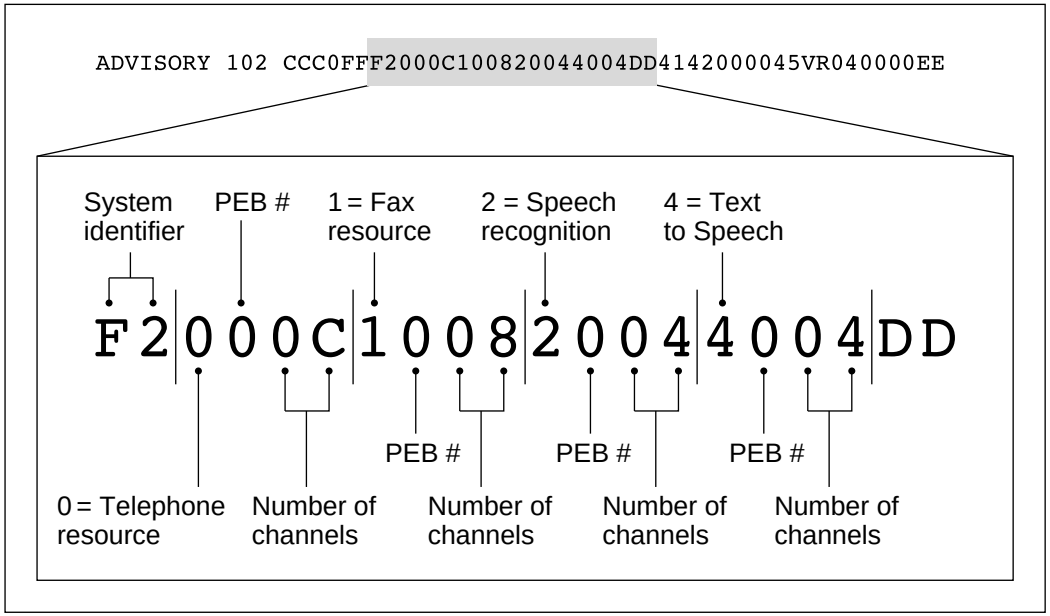

ADVISORY 102 CCC0FFF2000C10082004400437FFDD4142000045VR040000EE
System identifier
SCbus #
1 = Fax resource
2 = Speech recognition
4 = Text to Speech
F 2 0 0 0 C 1 0 0 8 2 0 0 4 4 0 0 4 3 7 F F D D
0 = Telephone resource
Number of channels
SCbus #
Number of channels
SCbus #
Number of channels
SCbus #
Number of channels
Switching matrix

Figure 23-2: Sample Advisory log on a PEB-based system


ADVISORY 102 CCC0FFF2000C100820044004DD4142000045VR040000EE
System identifier
PEB #
1 = Fax resource
2 = Speech recognition
4 = Text to Speech
F 2 0 0 0 C 1 0 0 8 2 0 0 4 4 0 0 4 D D
0 = Telephone resource
Number of channels
PEB #
Number of channels
PEB #
Number of channels
PEB #
Number of channels

Resource information in the Advisory log

Between the “FF” and the “DD”, the following information is provided in the Advisory Log:

1 The first two digits after “FF” indicate the type of system:

a F0 - MRS/AP

b F2 - MRS/Tower

c F3 - MRS/Rack

2 The system resources (telco cards, option cards) are then identified in four-digit segments:

a The first digit in the four-digit segment identifies the resource type:

- 0 = voice card/resource
- 1 = fax card/resource
- 2 = speech recognition card/resource
- 3 = switching resource (for SCbus systems only
- 4 = Text-to-Speech card/resource

b The second digit in the four-digit segment identifies the bus number. On SCbus systems, this digit is always zero.

c The third and fourth digits in the four-digit segment identify the number of channels for this specific resource. On SCbus systems, this is the number of channels for this resource on the entire system. On PEB systems, this is the number of channels provided by this particular resource card.

3 The four digits before “DD” refer to the switching matrix that is automatically installed in the system. This segment will appear only on SCbus systems, and will always appear as “37FF”:

- “3” indicates that the resource is a switching matrix.
- “7” indicates that the resource is system-wide. This is the only situation where this digit will not be 0 on an SCbus system.
- “FF” indicates the number of channels in hex form.

Additional information in the Advisory log

The following is listed after the resource information (from the “DD” code to “EE”):

1 “DD” stands for Disk Report Code.

2 After the “DD” is a group of ten digits which identify the VSN volumes that are configured.

a 41 - VSN volume A

b 42 - VSN volume B

c 43 - VSN volume C

d 44 - VSN volume D

e 45 - end of disk report

Note: If less than four VSN volumes are configured, the unconfigured volumes are represented by “00”. For example:

```
41 42 00 00 45
```

3 “VR” stands for version string code.

4 After the “VR” is a six-digit string which identifies the MRS software version. For example:

```
VR040000
```

5 “EE” marks the end of the Advisory log.

Solving system-wide problems

To unravel problems affecting the entire MRS system, try the following:

- Verify that the system configuration is correct.
- Review the transaction event log to check previous transactions occurring on the system.
- Look at the system and process status.
- If it is an unfolded system, validate the integrity of the communication link with the AP.

Verifying the system configuration

Refer to the *Symposium OPEN IVR System Administration Guide* for instructions on viewing and changing the system configuration.

Reviewing the transaction event log

The transaction event log is the repository of the system event and status messages and contains up to 300 of the most recent events at any time. This is a good source of information for tracking down events that led up to the current problem.

To display the log, follow these steps:

1 Log in to the MRS as `service`.

2 At the `/sci` prompt, type **`log`** and press <Enter>.

The SCI displays the system event log sorted by time, starting with the oldest events. It includes the event message ID and comment, and its severity level. There are five severity levels: advisory, minor, major, critical, and fatal. A numeric severity levels (with increasing importance) is associated with each level:

- ADVISORY – 0
- MINOR – 1
- MAJOR – 2
- CRITICAL – 3
- FATAL – 4

Note: If the MRS is installed on a network that supports the SNMP protocol and the SNMP service flag is enabled (see "`snmp`" option on the `/sci/config` menu), severity level errors are trapped and sent to the management host.

All standard "`pg`" options are valid while viewing the event log. The following example illustrates the first screen of a sample event log.

```
/sci>  log
12/13 14:35 HWM:     ADVISORY 3101 Process Shutdown
12/13 14:35 DCM1:    ADVISORY 2301 Process Shutdown
12/13 14:35 DCM4:    ADVISORY 2301 Process Shutdown
12/13 14:35 DCM7:    ADVISORY 2301 Process Shutdown
12/13 14:35 DCM10:   ADVISORY 2301 Process Shutdown
12/13 14:35 BFC1:    ADVISORY 2801 Process Shutdown
12/13 14:35 BFC2:    ADVISORY 2801 Process Shutdown
12/13 14:35 BFC3:    ADVISORY 2801 Process Shutdown
12/13 14:35 BFC4:    ADVISORY 2801 Process Shutdown
12/13 14:35 COM:     ADVISORY 2201 Process Shutdown
12/13 14:35 CONV:    ADVISORY 3001 Process Shutdown
12/13 14:35 UVM:     ADVISORY 2401 Process Shutdown
12/13 14:35 BAS:     ADVISORY 2901 Process Shutdown
12/13 14:35 VCS1:    ADVISORY 3201 Process Shutdown
12/13 14:35 VCS2:    ADVISORY 3201 Process Shutdown
12/13 14:35 PSM:     ADVISORY 2101 Process Shutdown
12/13 14:35 SYS:     ADVISORY 9001 System Stopped
12/13 14:59 SYS:     ADVISORY 9000 System Started
12/13 15:00 HWM:     ADVISORY 3100 Process Startup
12/13 15:00 COM:     ADVISORY 2200 Process Startup
12/13 15:00 VCS1:    ADVISORY 3200 Process Startup
12/13 15:00 UVM:     ADVISORY 2400 Process Startup
12/13 15:00 BAS:     ADVISORY 2900 Process Startup
:
```

The event log notes the time the event occurred and any reply codes.

Checking system and process status

By using the `system` and `proc` options accessible from the `/sci/status` menu, you can verify the current condition of the system and that all of the required processes are in fact running. The following two examples illustrate how you can check the status of your system.

```
/sci/status>  system

System Memory Usage
    Capacity 16000KB   Used 20264KB   Swapped 4392KB   Free 128KB

Active Mount Table
    /dev/vsnA read/write on Sat Dec 17 12:44:28 1994
    /dev/vsnB read/write on Sat Dec 17 12:44:29 1994
    /dev/vsnC read/write on Sat Dec 17 12:44:29 1994
    /dev/vsnD read/write on Sat Dec 17 12:44:29 1994

File System Usage Statistics
    VOLUME 1 - Capacity =   69.0MB    Used =   14.0MB    Free =   55.0MB
    VOLUME 2 - Capacity =   69.0MB    Used =    1.0MB    Free =   68.0MB
```

```
    VOLUME 3 - Capacity =   69.0MB    Used =    1.0MB    Free =   68.0MB
    VOLUME 4 - Capacity =   69.0MB    Used =    1.0MB    Free =   68.0MB

Active Network Connections
    Local Address          Foreign Address        (state)
    /dev/tty2a             N/A                    ESTABLISHED
```

As you can see in the example, the `system` option lists memory usage, showing the total capacity and the amount that is used, swapped, and available. The Active Mount Table lists the virtual volumes that are installed, the associated access privileges, and the time and date that they were mounted. Also listed are file system usage statistics. The capacity of each volume is identified, along with the space that is used and currently available.

The Active Network Connections section of the display lists the current connection between the MRS and the AP. If the AP is connected to the MRS via the serial communications link (RS-232-C), only the local address is listed, showing the port identifier. If the connection is over a local area network, the local address identifies the MRS host name. The foreign address identifies the host name or IP address of the AP on the network, and the state identifies the current state of the connection (for example, established). Multiple connections are possible; however, only one AP can control channels on the MRS.

If you enter the `proc` option, the SCI lists the time the system was rebooted and information about each process on the MRS, including the time the process was started, the name of the process, its UNIX process ID and queue ID, and its current status, as shown below. Table 23-1 on page 23-19 lists the possible process status.

```
/sci/status>  proc
[01/15 06:01]               System      Stopped
[01/15 06:01]                  log      Stopped
[01/15 06:01]              trapGen      Stopped
[01/15 06:01]                  ssb      Stopped
[01/15 06:01]     /usr/vrs/exe/hwm      Stopped
[01/15 06:01]     /usr/vrs/exe/dcm      Stopped
[01/15 06:01]     /usr/vrs/exe/com      Stopped
[01/15 06:01]     /usr/vrs/exe/uvm      Stopped
[01/15 06:01]     /usr/vrs/exe/bas      Stopped
[01/15 06:01]    /usr/vrs/exe/rmgr      Stopped
[01/15 06:01]    /usr/vrs/exe/atts      Stopped
[01/15 06:01]     /usr/vrs/exe/psm      Stopped
```

Table 23-1: Possible process status

Status	Description
Started But Not Ready	Experienced fatal errors during initial execution
Ready But Not Running	Started successfully and is waiting for all other processes to report successful startup
Running	Currently running
Exited	Terminated prematurely
Stopped	Stopped due to system shutdown or reset

Verifying the communication link

You can verify the integrity of the communication link between the MRS and the AP by using the `ping` command. You will need to know the name or IP address of the AP to which your MRS is connected. If you do not know the other hosts names or IP addresses, the hosts file on the MRS/Tower or MRS/Rack is supposed to contain not only the IP address of the local system but also the IP address of the other system. The hosts file on the MRS/Tower or MRS/Rack can be viewed by using the `/sci/admin/hosts>list` command.

Ping from the MRS

The following is an example of using the `ping` command from SCI. To stop the ping command, press <Delete>.

```
/sci/diag>  ping
Enter the Host Id of the machine to Ping:  nortel
PING nortel (10.10.1.10): 64 data bytes
72 bytes from nortel (10.10.1.10): icmp_seq=0 ttl=255 time=10 ms
72 bytes from nortel (10.10.1.10): icmp_seq=1 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=2 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=3 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=4 ttl=255 time=10 ms
72 bytes from nortel (10.10.1.10): icmp_seq=5 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=6 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=7 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=8 ttl=255 time=0 ms
72 bytes from nortel (10.10.1.10): icmp_seq=9 ttl=255 time=0 ms

--- nortel ping statistics ---
10 packets transmitted, 10 packets received, 0% packet loss
round-trip min/avg/max = 0/2/10 ms
/sci/diag>
```

Ping localhost

Another diagnostic feature of the `ping` command is to `ping` the host name of `localhost` which identifies this same host. If the `ping` command cannot even `ping` itself, the problem is probably located in the LAN card.

Ping from the AP

To use the `telnet` and `ping` commands from the AP, follow these steps.

1 Press Ctrl-Alt-F1 to access the command-line interface.

2 Log in to the AP as `root`.

3 Perform the ping test.

a Ping the localhost first. This will validate that the software is functional.

b Type **`ping -c10 localhost`** and press <Enter>.

Ten packets of data should be transmitted and received.

c Ping the hostname of this host. This will check the Ethernet card on this host. Type **`ping -c10 hostname`** where hostname is the host name of the AP and press <Enter>.

Ten packets of data should be transmitted and received.

d Type **`ping -c10 hostname`** where hostname is the host name of the MRS and press <Enter>.

Ten packets of data should be transmitted and received.

4 Perform the telnet test.

a Issue the `telnet` command in the following syntax: **`telnet IP address`** or **`telnet host name`** where *`IP address`* or *`host name`* is the IP address or host name of the MRS.

b You should get a login prompt from the MRS.

c Log in to the MRS as `service`.

d When the SCI menu appears, choose `admin`.

e From the admin menu, choose `network`.

f From the Network menu, choose `telnet` and then, when prompted, enter the Host Id of the AP.

The login prompt should appear from the AP.

g Log in to the AP as the `nortel`.

The $ prompt should appear.

h To exit from the AP, type **`exit`** at the $ prompt and press <Enter>.

i At the prompt, type **done** and press <Enter>. Repeat until you return to the `/sci>` prompt.

j Type **`quit`** and press <Enter> to return to the # prompt on the AP.

Hosts file troubleshooting

If the `ping` command is unsuccessful, the problem could be in the setup of the host file on either the MRS or the AP. For an example and explanation of the hosts file, see “Default network configuration” on page 13-2.

To change the hosts file on the MRS/Tower, MRS/Rack, or AP, see “Changing the LAN IP address or host name” on page 13-9.

Note: The AP can be accessed from a dial-up session into the MRS/Tower or MRS/Rack by using the `/sci/network>telnet` option. This option will allow logging in to the AP and making alterations to that machine.

Using the Auto-Announce mode while system is down

When a communication link failure occurs, you typically follow an escalating approach for reestablishing the link. To use Auto-Announce mode, follow these steps.

1. Check all cables between the AP and the MRS to verify that they are attached and terminated properly.
2. If step 1 fails to reestablish the link, reset the MRS.
3. If resetting fails to reestablish the link, reboot the MRS.
4. If rebooting fails, select the `announce` option in the `sci/maint` menu to configure the system for Auto Announce mode and call your service representative.

In step 4, entering Auto Announce mode simulates a host failure and places the MRS in the `AP Link Failure Mode` already set up in the system configuration parameters (`/sci/config/sys`). The `AP Link Failure Mode` parameter defines the system behavior when communication with the AP is abruptly lost. This parameter can be set to ignore all new calls, busy out all trunks so that no new calls are received, or run an embedded Auto Announce application, which automatically answers all calls and informs the caller that the system is temporarily out of service.

Gathering call statistics

There are tools for generating statistics about call activity. To generate a call activity report, access the `/sci/status/calls` menu. Options are available for displaying daily or hourly call activity. Refer to the *Symposium OPEN IVR Service Console Interface Reference Manual* for further information about these options.

```
       /sci/status/calls/graph>  totals
                        Call Statistics Graph by Hour
     Incoming: d=Detected A=Accepted - Outgoing: p=Placed S=Successful
800  .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
600  .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
400  .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..
200  .. .. .. .. .. .. .. .. .. .. .. .. A. .. A. .. .. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. A. .. A. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. A. .. A. .. .. .. .. .. .. .. ..
       .. .. .. .. .. .. .. .. .. .. .. .. .. A. .. A. A. .. .. .. .. .. .. ..
============================================================
       00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
```

If you are looking at the MRS, you can read the front panel indicators to check the current state of a channel. But what if the MRS is at a remote location, or you simply want a quick way of knowing what is going on with each of the available channels? Access the `/sci/status/map` menu. This menu lists options for displaying in real time the current state of each audio channel (for example, IDLE, BUSY, CALL, DIAL, RECD, PLAY, WINK, TEST, HANG, RING), as well as its state as an ACD agent (logged on or off).

```
/sci/status> map
states         - Display the current audio state of all trunks.
acd            - Display the current ACD state of all trunks.
combined       - Display all current state information of all trunks.
cancel         - Return to the previous menu.
/sci/status/map> state
```

Table 23-2: Telephony Server – Channel Status Interface

	0	1	2	3	4	5	6	7	8	9
0	idle	busy	play	recd	call	dial	test	hang	????	dial
10	busy	busy	busy	play	call	dial	test	recd	test	busy
20	play	idle	dial	dial	busy	dial	hang	busy	????	hang
30	dial	busy	test	hang	dial	????	play	????	????	????
40	call	call	dial	idle	busy	dial	dial	test	play	idle
50	????	play	call	call	call	call	recd	call	test	idle
60	test	test	play	????	call	idle	dial	hang	????	hang
70	hang	recd	busy	play	????	dial	????	????	????	dial
80	play	idle	call	????	recd	dial	????	????	idle	idle
90	call	call	call	call	call	call	call	call	call	call
100	????	play	play	call	call	idle	test	recd	????	play
110	dial	test	call	play	dial	dial	recd	????	????	dial

With this tool you can see the current state of a channel only if the state of the channel has changed since the time you started the map tool. Blank space indicates that the channel is not present. "????" indicates that the channel status has not changed since the map tool was started.

Note: Displaying acd status will not work correctly unless you are using the trunk files distributed with MRS software for Symposium OPEN IVR.

Isolating a channel fault

You can use several tools to isolate channel faults. You can test a single analog channel, run an embedded call-in test on a range of channels, or test a T1 or E1 span.

These tests are accessed as options on the `/sci/diag` menu. While you are working in this menu environment, you can review current test results as well as results from the previous test session.

```
/sci> diag
chan          - Single loopstart channel diagnostics test.
verbose       - Dynamically place processes in verbose mode.
dual          - Dual loopstart channel diagnostics test.
calltest      - Control the internal callin test.
ping          - Ethernet connection diagnostics test.
t1diag        - Perform T-1 diagnostic functions.
e1diag        - Perform E-1 diagnostic functions.
acd           - Control the ACD state of a channel.
view          - View results from current diagnostics tests.
last          - View results from last diagnostics tests.
done          - Return to the previous menu.
/sci/diag>
```

Error messages

Refer to the *Symposium OPEN IVR Error Messages Guide* for a detailed description of error messages and test results for the `chan`, `dual`, and `calltest` options.

Using verbose mode

> ***Note:*** To the untrained user, running in verbose mode is potentially harmful. However, for trained service personnel, this tool may be essential for troubleshooting the system.

The `verbose` option on the `/sci/diag` menu can be useful for reviewing detailed process internals. When you select this option, the SCI prompts you to identify the process to be placed in verbose mode, and whether the output should be sent to the standard output (that is, screen) or to a file. A process can be placed in verbose mode on the fly without stopping the system.

You should be aware that verbose mode will affect system performance. Piping output to standard output can slow down normal operation. On the other hand, if you redirect output to a file, you must monitor and control the size of the file to prevent filling up the disk.

To remove the verbose file, you must stop the verbose mode for that process, remove the file, and then restart the verbose mode. However, all this can be done without stopping any processes or interrupting normal system activity.

Testing loopstart channels

Single loopstart channel test

You can run a basic test on a single loopstart channel by selecting the `chan` option from the `/sci/diag` menu. The `chan` option tests the accessibility of the trunk interface module on which the channel is located and the network integrity between the trunk card and the external telephone network. (For a more thorough test of system functionality, refer to the `calltest` option.)

When you select this option, the SCI prompts you to identify the channel to be tested. The MRS detaches the specified channel from the AP and starts the test. Once the test has been completed, the MRS releases the channel for access by applications running on the AP.

Refer to the *Symposium OPEN IVR Error Messages Guide* for a detailed description of error messages and test results.

The results of the test are displayed on the screen and also logged in the test log in the form of messages as shown below.

```
/sci/diag>  chan
í**************************************************
*****
WARNING - The trunks which are to be tested MUST be
inactive.
     Otherwise errors may result in host processing.
**************************************************
*****
Are you sure you wish to continue? Current continue?  =
no
yes - Continue with operation.
no - Return to previous menu.
   continue?  = yes
Default Channel number to test = 0
   Channel number to test =
Beginning testing on channel #0x0
START - Hookswitch Test
PASS  - Hookswitch Test
Test Completed
/sci/diag>
```

Refer to the *Symposium OPEN IVR Error Messages Guide* for a detailed description of error messages and test results.

Dual loopstart channel test

If the /sci/diag>chan test successfully accesses the network, you can then try to establish a path through the network by using the /sci/diag>dual option. The dual loopstart channel diagnostics test verifies that a path can be established across the network from one channel to another.

When you select the dual option, the SCI prompts you to identify the two channels and the telephone number that will attempt to connect the two channels. The MRS detaches both channels from control by the AP and runs the test. Once the test is completed, the MRS releases the channels and returns control to the AP.

Refer to the *Symposium OPEN IVR Error Messages Guide* for a detailed description of error messages and test results.

Below is an example of running the Dual Loopstart Channel Diagnostics test.

```
/sci>  diag
/sci/diag>  dual
**********************************************
WARNING - The trunks which are to be tested MUST be
inactive.
Otherwise errors may result in host processing.
**********************************************
Are you sure you wish to continue?
Current continue? = no
yes      - Continue with operation
no       - Return to previous menu.
   continue? = yes
Default Originating Channel number to test = 0
         Originating Channel number to test = 1
Default Terminating Channel number to test = 0
         Terminating Channel number to test = 0
Enter the phone number to use when calling from the first
channel to the second channel:  7960
Beginning testing on channel #0x1 and #0x0 using phone
#7960
START - Connection Test
PASS - Connection Test
START - DTMF Test
PASS - DTMF Test
Test Completed
/sci/diag>
```

Embedded call-in test (loopstart and T1 lines)

The `calltest` option displays a submenu of options for running an embedded call-in application that verifies functionality of a single channel or a range of channels. This diagnostic test is particularly useful for service personnel during system installation or site maintenance to verify basic functionality of selected channels, such as DTMF detection, record and play, and outdial and hangup. This test can still test the MRS/Tower or MRS/Rack even if the AP is not connected. This test is a good test of the MRS software, but not the AP.

Refer to the *Symposium OPEN IVR Error Messages Guide* for a detailed description of error messages and test results.

To execute the `calltest` option, follow these steps.

1 Select `calltest` from the `/sci/diag` menu. The following menu appears:

```
/sci/diag>  calltest
start- Start the internal call in test.
reload- Reload internal call in test prompts.
stop- Stop the internal call in test.
done- Return to the pervious menu.
/sci/diag/calltest>
```

2 Select the `reload` option to reload test prompts into the VSN area. The reload takes about 10 seconds to complete.

The following messages are displayed:

```
/sci/diag/calltest>  reload
Reloading Test Prompts...
Test Prompts Reloaded
```

3 Select the `start` option.

The SCI prompts you to identify the range of channels to be tested. These specified channels will be detached from the application processor until you select the stop option to exit the call-in test.

An example of the screen messages is shown below.

```
/sci/diag/calltest>  start
*****************************************
WARNING - The trunks which are to be tested MUST be
inactive.    Otherwise errors may result in host
```

```
processing.
*****************************************
Are you sure you wish to continue?
Current continue?  = no
yes         - Continue with operation.
no          - Return to previous menu.
        continue?  = yes
Default Start of Channel Range to test = 0
        Start of Channel Range to test =  0
Default End of Channel Range to test = 47
        End of Channel Range to test =  11
Default Channels to test: (All, Even, Odd) = All
        Channels to test: (All, Even, Odd) = all
Channels Allocated Successfully
Test Application Started
```

4 Call in to the system on one of the selected channels.

The MRS will play a message indicating that the system is temporarily out of service.

5 Wait for the message to complete, then, *within 30 seconds*, use the telephone keypad to enter the security code of **88888#** which causes the MRS to play the following test menu options:

a Press 1 for DTMF Test.
This tests for DTMF detection. The application prompts you to enter a digit on your telephone keypad. As you press a key, the application plays a corresponding prompt. Enter the digits fast to simulate real-life use of the keypad. Press # to return to the Main Menu.

b Press 2 for Play Test.
This tests the play function. The application prompts you to enter an existing message number followed by #, and then plays the corresponding message. Enter a number from 130 to 139 followed by a # sign to hear letters of the alphabet. Press # to return to the Main Menu.

c Press 3 for Record Test.
This tests the record function. The application prompts you to enter an unused VSN number to identify the message you wish to record, followed by #. Use a VSN # like 600. The test then prompts you to record the message. To repeat the message, press any key. Press # to return to the Main Menu.

d Press 4 for Outdial Test.
This tests an outdial feature. The application prompts you to enter the number you wish to call, followed by #. When you hang up, the application calls the number you entered. Once you answer the call, press any key to return to the Main Menu.

e Press 5 to Exit.
This hangs up the line and returns to an idle state. To access the application's Main Menu, again, follow steps 1 through 3 above.

6 To stop the test, select the `stop` option, followed by `done`, as in the example below.

```
/sci/diag/calltest>  stop
Test Application Stopped
Timed Out without Receiving Reply from PSM
/sci/diag/calltest>done
```

Testing a T1 span

To test a T1 trunk interface and the integrity of the T1 network, select the `t1diag` option to access a submenu of tools to test a T1 span. You can use the `loopback` option to place a T1 span in loopback mode for connecting network test equipment to the T1 line and running diagnostics, or the `alarm` option to assert T1 alarms for switch debugging.

You can also run the Call-In Test application to test the T1 network, as described in "Embedded call-in test (loopstart and T1 lines)" on page 23-29.

The `loopback` test and the `alarm` option are described in this section.

T1 channel loopback test

The `loopback` option allows you to place a T1 span in loopback mode for connecting network test equipment to the T1 line and running diagnostics. The loopback test gives you the capability to perform single-ended fault isolation on a T1 line. The receive signal is looped back to the transmit pair. The loopback signal includes regeneration but does not remove bipolar violations. While the T1 card is in loopback mode, the T1 red alarm and the system alarm will be on.

An example of the loopback test is shown below:

```
/sci/diag>  t1diag
loopback - Control T-1 span loopback mode.
alarm    - Control Alarms on a T-1 span.
done     - Return to the pervious menu.
/sci/diag/t1diag>  loopback
on       - Put T-1 span in loopback mode.
off      - Take T-1 spans out of loopback mode.
done     - Return to the previous menu.
/sci/diag/t1diag/loopback>  on
**************************************************
WARNING - The trunks which are to be tested MUST be
inactive.
         Otherwise errors may result in host processing.
**************************************************
Are you sure you wish to continue?
Current continue? = no
yes      - Continue with operation.
no       - Return to pervious menu.
         continue? = yes
Default T-1 Span to Loopback to Network = 1
         T-1 Span to Loopback to Network = 1
loopback mode on
/sci/diag/t1diag/loopback>  off
Default T-1 Span to Return to Normal Operation = 1
Return to Normal Operation = 1
loopback mode off
/sci/diag/t1diag/loopback>
```

T1 alarm diagnostics

The `alarm` option can be used to assert T1 alarms for switch debugging. The `alarm` option accesses a submenu of options for asserting and clearing yellow and/or blue alarms on a T1 line.

A yellow alarm is defined as a remotely detected failure. In a blue alarm mode, the system generates an all 1's pattern. To assert or clear yellow and blue alarms on a T-1 line, select the `on` or `off` option from the submenu.

An example of the alarm option is shown below:

```
/sci/diag>  t1diag
loopback - Control T-1 span loopback mode.
alarm    - Control Alarms on a T-1 span.
done     - Return to the previous menu.
/sci/diag/t1diag>  alarm
on       - Assert an Alarm on a T-1 span.
off      - Clear an Alarm on a T-1 span.
done     - Cancel this operation.
/sci/diag/t1diag/alarm>  on
Default T-1 Span to Assert Alarm On = 1
         T1 Span to Assert Alarm On =
Current alarm type = yellow
yellow   - Yellow Alarm.
blue     - Blue Alarm.
         alarm type =
Alarm Turned On
/sci/diag/t1diag>
```

Reinitializing a channel

The `/sci/maint>init` option reinitializes a specific channel. When you select this option, the SCI prompts you to identify the channel. The channel you identify is gracefully detached from applications running on the AP, reinitialized, and then returned to AP control.

This option is particularly useful for resetting channels that enter an unknown state during debugging of application software.

> ***Note:*** When reinitializing an ACD channel, the `init` option will force the channel to log off from the ACD queue. When it is ready, the AP will force the channel to log back on to the queue if the ACD Logon option is installed. For details on the ACD Logon feature, see the *Symposium OPEN IVR Service Console Interface Reference Manual*.

Modifying the state of an ACD channel

If you need to change the logon/logoff state of an ACD channel during testing, select the `acd` option from the `/sci/diag` menu.

```
/sci/diag>  acd
Default Channel to Logon/Logoff = 1
        Channel to Logon/Logoff =  1
Enter the new state for this channel
Current new state?  = off
on           - The channel is logged on.
off          - The channel is logged off.
        new state?  = on
ACD State Change Initiated
```

Note: The `acd` option will not work unless the ACD Logon option is installed. For details on the ACD Logon feature, see the *Symposium OPEN IVR Service Console Interface Reference Manual*. Even so, changing the ACD queue state from within the SCI may interfere with the MRS controlled by an AP. Consequently, this option is limited to affecting only a couple of states.

DOS-based diagnostics and PC Diags

The DOS-based diagnostics are located in the `C:\DIAGS` directory in the DOS partition. These diagnostics include card-level diagnostics from the card manufacturers and the general PC hardware diagnostic tool PC Diags.

A batch utility `diag` can be run at the `c:` directory level to produce a menu of DOS-based diagnostics, including PC Diags.

Running DOS-based diagnostics

To run the DOS-based diagnostics that are on the IVR system, follow these steps:

1. Insert an MS-DOS 5.0 or higher version system diskette in the floppy drive.
2. Shut down and reboot the system. For shutdown and reboot instructions, see Chapter 2, "Before you begin."
3. Type **`c:`** and press <Enter>.
4. Type **`diag`** and press <Enter>.

   A list of diagnostic tools are displayed.

```
------------------------------
OSIVR 4.0 Diagnostics Utilities
------------------------------

Press 1 for PC Diags
Press 2 for 3COM
Press 3 for Znyx
Press 4 for Madge
Press 5 for DIGI
Press 6 for Brooktrout
Press 7 for Sync570
Press 8 for SMC
Press q to exit this program
Enter your choice [1,2,3,4,5,6,7,8,Q]?
```

5. Type in your selection and press <Enter>.

   Each diagnostic utility provides its own interface. Messages and prompts are present to assist you.

   For instruction on `PC Diags`, see "Using PC Diags" on page 23-36.

Using PC Diags

To use PC Diags, follow these steps:

1. Run diag and select `PC Diags`, as described in "Running DOS-based diagnostics" on page 23-35.

   The PC Diags interface is displayed.

2. To access PC Diags help, insert the PC Diags Help floppy disk.

3. Highlight the "TEST" menu if it is not already highlighted, and press <Enter>.

4. Select your system configuration and press <Enter>.

   A list of tests is displayed.

   Tests which are not available are shown in a different color. If you select one of these tests and attempt to execute it, the following message is displayed:

   ```
   Selected test: disabled (press any key ...)
   ```

5. Select a test and follow the instructions.

Telco card diagnostics

The telco cards in an IVR system can be tested using diagnostics from the card manufacturers.

D/41ESC or D/160SC-LS card

The Universal Dialogic Diagnostics (UDD) for UNIX can be used to test the D/41ESC or D/160SC-LS card, as follows:

1. Stop and unload all applications.

2. Press <Ctrl-Alt-F1> to access the command-line interface.

3. Log in as `root` on the MRS or MRS/AP that you are testing.

   Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

4. Type **`cd /usr/dialogic/bin`** and press <Enter>.

5. Type ./**udd** and press <Enter>.

6. Select all applicable boards.

7. Select the following tests:

a Board Sanity Check

b Shared RAM Test

c Local RAM Test

d DSP Test

e Board Timer Test

f On Board Interrupt Test

g SC2000 Test

h EEPROM Test

8 Run the selected tests.

Test time

This test takes less than 5 minutes.

Test result expected

The test result will be displayed on the screen or printed in a report as either PASSED or FAILED. Error messages will be displayed for failed tests.

D/240SC-T1 or D/320SC card

The Universal Dialogic Diagnostics (UDD) for UNIX can be used to test the D/240SC-T1 or D/320SC-LS card, as follows:

1 Stop and unload all applications.

2 Press <Ctrl-Alt-F1> to access the command-line interface.

3 Log in as `root` on the MRS or MRS/AP that you are testing.

Note: On an MRS, obtain a UNIX shell after logging in. At the `/sci` prompt, type **`maint shell`** and press <Enter>.

4 Type **`cd /usr/dialogic/bin`** and press <Enter>.

5 Type ./**udd** and press <Enter>.

6 Select all applicable cards.

7 Select the following tests for the base card:

a Board Sanity Check

b Shared RAM Test

c Local RAM Test

d DSP Test

e Board Timer Test

f On Board Interrupt Test

g SC2000 Test

h EEPROM Test

8 Select the following tests for the daughter card:

a Board Sanity Check

b Shared RAM Test

c Local RAM Test

d DSP Test

e Board Timer Test

f On Board Interrupt Test

g SC2000 Test

h EEPROM Test

9 Run the selected tests.

Test time

This test takes less than 8 minutes.

Test result expected

The test result will be displayed on the screen or printed in a report as either PASSED or FAILED. Error messages will be displayed for failed tests.

SCSISelect utility

SCSISelect is the utility that can be run on the MRS/Tower or MRS/Rack to diagnose problems with the Adaptec Disk Adapter and the hard disk.

1 Check that an SVGA terminal is connected to the MRS.

Note: For Release 2.x MRS servers, ensure that you have:

- Installed a monochrome monitor card in any of the empty slots of the MRS.
- Attached a monochrome monitor to the monochrome monitor card.
- Attached a keyboard to the keyboard connector on the back of the MRS.

2 Boot the system and, when the message indicating CONTROL <A> SCSISelect appears, press <Control><A>.

A screen should appear that allows viewing of the disk controller configuration, testing of the disk controller, and testing of the disk.

3 Verify the disk controller setup.

4 Test the Disk Controller.

5 Test the disk. Scan it only — DO NOT format the disk.

Debugging trunk type files

If you edit trunk type files or create new files, you should verify that there are no syntax errors. The reason is that, after you reset the system to enable your changes, trunk type files containing errors will not allow the system to use the corresponding channels.

To check whether your trunk type file meets the syntax requirements, select the `syntax` option from the `/sci/maint/params` menu.

Note: The `syntax` option reports only the first found syntax error. Consequently, you should run this option repeatedly until no errors are reported.

Description of IVR tools

The following tools are found in the `/u/nortel/tools` directory on the AP:

- audit — displays the last 100 ipc calls
- bup — backs up files to a device, restores backed-up files, and enables creation of a daily backup schedule
- cnvrt — converts vsn numbers
- devnt — displays delivery events
- dmsgd — displays message database
- exp — records data files in stat.d and exports into an ASCII file as comma, separated fields
- genshut — forcefully stops process IDs for the AP software and frees all of its system resources
- gen stop — stops AP software
- gen start — starts AP software
- greset — resets AP software
- mvpmt — moves a range of prompts
- nedit — GUI-style text editor; displays system reports and can be used as a text editor such as vi or scoedit
- ralrm — resets minor alarm; can do remotely or by the System Monitor
- rstat — resets statistics
- sched — schedules delivery of outgoing applications
- sconfig — provides a system administrator with the ability to turn call auditing on or off for Symposium OPEN IVR (cells have the capability of auditing calls)
- shvsn — runs from sys_files directory to display vsnx.data
- statsbkup — backs up stats file
- version — shows Symposium OPEN IVR revision numbers of each main process; you can also use `cat` to view the startup file and see the processes running on the AP

- vlm_options — checks the license manager security keylock for options; for more information on license manager tools, refer to the *Symposium OPEN IVR Service Console Interface Reference Manual.*
- vsn — runs from sys_files directory to update vsnx.data

Chapter 24: Verification test (NTTEST)

Introduction

Part of the initial installation process consists of verifying that the OPEN IVR system functions successfully. In addition, whenever new options are added to the system, the verification process for that option should be performed. If the system is experiencing problems, some of the verification steps could also be used in an attempt to isolate the problem.

System verification is performed by loading the NTTEST applications on the Application Processor and assigning the application to available channels. The tester then calls into the channels and listens to the prompts. The prompts guide the tester through the various tests.

> ***Note:*** The prompts and error messages used by NTTEST have only been recorded in US English. No other language is currently supported for NTTEST.

The NTTEST applications are part of the base Symposium OPEN IVR 4.0 system.

Other test applications are also available on the MRS to test loopstart or T1 channels. For more information on these tests, see “Isolating a channel fault” on page 23-25.

Tests available in NTTEST

NTTEST is comprised of a main application (NTTEST_MN) and sub applications for additional tests. This following section gives a brief description of what each test does.

DTMF test (part of NTTEST_MN)

This option performs a check for DTMF detection. This test determines if the voice processor card on an analog system, or the D240 SC-T1 card can detect DTMF tones.

Record test (part of NTTEST_MN)

This option tests the capability of the system to record, play and delete a message.

Flash-hook test (part of NTTEST_MN)

This tests flash-hook and conference capability. It allows you to confirm that out-dialing works on the system and that you can call another phone.

Check that both flash hook and conference options are enabled on the PBX or the central office switch.

Fax test (NTTEST_Fax)

This option tests that the system can receive and a same fax. For more information on using the Fax test, refer to the *Symposium OPEN IVR 4.0 Fax Option Guide.*

Speech Recognition test (NTTEST_SRg)

This option tests both the continuous and discrete Speech Recognition features. For information on the Speech Recognition test, refer to the *Symposium OPEN IVR 4.0 Speech Recognition Option Guide*.

Text-to-Speech test (NTTEST_TTS)

This option tests the Text-to-Speech feature. For more information, refer to the *Symposium OPEN IVR 4.0 Text-to-Speech Option Guide*.

ADSI test (NTTEST_ADSI)

The ADSI test allows you to test the the use of an ADSI display telephone with OPEN IVR.

SNMP test(NTTEST_SNMP)

The SNMP test does the following:

- generates a SNMP trap and delivers it to the UNIX port
- tells the caller where to look for the SNMP Trap
- handles errors as described in “Error handling” on page 24-6
- returns to the menu

Note: If the IVR system is connected to a network, the SNMP trap will be sent over that network to IBM Netview 6000 Version 3.1, the only Network Management System that is currently supported. The trap can be monitored using the UNIX command, `trap_rece &`. This command directs any traps received on port 162 to the shell console. To test that the port is receiving traps independent of the SNMP application, execute the `trap_send localhost public 1` command from the UNIX prompt.

SCbus Transfer via Conference test (NTTEST_STC)

On SCbus systems, this tests the ability to conference two calls with OPEN IVR.

Note: The SCbus Transfer via Conference test requires an outbound channel to be set in the IVR system. If no such channel is set, the test can not do the transfer.

Meridian Route Optimization (NTTEST_MRO)

This tests the Route Optimization feature if installed on the Meridian switch.

Note: This application can be used where the ISDN Digital Private Network Signalling System (DPNSS) protocol is used with a Meridian PBX. For successful completion of the application (i.e. the Meridian switch disconnects the IVR system from the call), the Meridian Switch must be provisioned with the Route Optimization option.

Retrieval of DNIS and CLID and Calling Line Category (NTTEST_RET)

This tests the retrieval of the Dialed Number Identification Service (DNIS), Calling Line ID (CLID), and Calling Line Category of the call.

Note: This test is independent of the protocol used, whether it is "Q" Signalling (QSIG), Digital Private Network Signalling System (DPNSS), European Integrated Digital Network (Euro-ISDN), Digital Access Signalling System (DASS), CO-side T1 (in-band signalling) or North American ISDN-Primary Rate Interface (PRI) (out of band signalling).

IPML test (NTTEST_IML)

This tests the setup of the Integration Package for Meridian Link option. See the *Integration Package for Meridian Link User Guide* for more information.

Dial Pulse Detection (NTTEST_DPD)

This tests the Dial Pulse Detection (DPD) functionality of DPD-enabled cards.

Web Option test (NTTEST_WEB)

The Web Option test requires additional setup, and is not invoked by NTTEST_MN. Refer to the *Symposium OPEN IVR Web Option Guide* for setup information.

Main menu and submenu choices

Table 24-1 lists the menu and submenu choices offered by NTTEST. When running NTTEST, only select the choices for options for which the system is licensed.

Table 24-1: NTTEST menu choices

Main Menu	Sub-Menu	Choice	Test application (if not included in NTTEST_MN)
0		Hookflash Transfer	
1		DTMF	
2		Recording, Playing and Deleting Messages	
3		Fax	NTTEST_Fax

Main Menu	Sub-Menu	Choice	Test application (if not included in NTTEST_MN)
4		Speech recognition Sub-Menu	NTTEST_SRg
5		Text To Speech	NTTEST_TTS
6		Advanced Features Sub-Menu	
	1	ADSI	NTTEST_ADSI
	2	SNMP	NTTEST_SNMP
	3	SCbus Transfer via Conference	NTTEST_STC
	4	Meridian Route Optimization	NTTEST_MRO
	5	Retrieval of DNIS, CLID, and Calling Line Category	NTTEST_RET
	9	Repeat menu choices	
	*	Go to Main Menu	
	#	Exit	
7		Applications Sub-Menu	
	1	IPML	NTTEST_IML
	9	Repeat menu choices	
	*	Go to Main Menu	
	#	Exit	
8		DPD	NTTEST_DPD
9		Repeat the menu	
#		Exit	

Note: The Web Option test requires additional setup, and is not invoked by NTTEST_MN. If you are testing the Web Option, refer to the *Symposium OPEN IVR Web Option Guide* for setup information.

Error handling

Error voice messages

When an error path is taken from a cell, the NTTEST application plays back an alphanumeric message. Refer to the file `NTTEST_readme` for a description of the alphanumeric code and for actions to take.

Event log

Successful completions of tests are recorded in the `event.log` file in directory `/u/nortel/log.d`.

Prompts used for NTTEST

NTTEST uses the prompts in the range 400–499. The prompts must be loaded prior to using NTTEST.

Note 1: Some prompts are reserved for future use and may cause errors during a bulk prompt transfer. These errors can be safely ignored.

Note 2: If prompts in the NTTEST range are currently being used in the system, they should be backed up prior to running the NTTEST application, and then restored after NTTEST has been run. See the *Symposium OPEN IVR* System Administration Guide for instructions on backing up and restoring prompts.

Table 24-2 lists the complete set of prompts used by NTTEST with the exception of system prompts.

Table 24-2: Complete list of prompts supported by NTTEST

Prompt Number	Prompt Text
400	Welcome to the Integration Package for Meridian Link test
401	To do a two-step transfer press 1
402	To do a FAST transfer press 2
403	To do a two-step conference press 3
404	To do GetCallInfo press 4
405	The Init Transfer passed.

Prompt Number	Prompt Text
406	The Init Transfer failed
407	The Fast Transfer passed.
408	The FAST Transfer failed.
409	The Init Conference passed.
410	The Init Conference failed.
411	The GetCallInfo passed.
412	The GetCallInfo failed.
413	The Complete Transfer passed.
414	The CompleteTransfer failed
415	The Complete Conference passed.
416	The Complete Conference failed.
417	The RetrieveTransfer passed.
418	The RetrieveTransfer failed.
419	The RetrieveConference passed.
420	The RetrieveConference failed.
421	To do a CompleteTransfer press 0.
422	To do a RetrieveTransfer press 1.
423	To do a CompleteConference press 0.
424	To do a RetrieveConference press 1.
425	Please enter the destination DN followed by number sign.
426	Please enter the time-out type. 0 for rings or 1 for minutes.
427	Please enter the time-out value followed by number sign. Valid entries are 1 to 32.
428	Enter the destination DN type followed by number sign. Valid entries are 0 to 30.

Prompt Number	Prompt Text
429	That is an invalid entry.
430	To QueryCallInfo on the current call press 0, by callid press 1 and by network callid press 2.
431	Enter the CallId.
432	A callflow error has occurred.
433	A callflow time-out has occurred.
434	The destination DN was busy.
435	The destination DN did not answer.
436	The return code was...
441	Clean-up in progress.
442	A failure has occurred in one of the user-functions.
443	Thank you for using the Integration Package for Meridian Link test.
444	Please press 1 for the VCS technology, press 2 for the PureSpeech technology, press star to return to the NTTEST main menu, press number sign to exit or press 9 to repeat this menu.
446	Please dial 1 to retry the test, dial 2 to exit, or dial 9 to repeat this menu.
447	You have not entered ten digits.
448	Please enter the number of digits you will speak followed by the number sign. Valid values are 1 to 10.
449	Please enter the second digit followed by number sign.
450	To execute the DNIS, CLID and Calling Line Category Retrieval, you need to have the DNIS and ANI parameters set in the trunk file on the MRS to the number of digits you expect to retrieve.

Prompt Number	Prompt Text
451	To execute the Meridian Route Optimization, you need to set parameter transit equal to 1 in the trunk file of the MRS, and you need Route Optimization set in the Meridian switch.
452	To execute the SCbus Transfer via Conference option, you need the DMX software license and you need to be running on a SCbus system
453	To repeat this menu press 9
454	To execute the Integration Package for Meridian Link test, you need an appropriate software licence and Meridian Link Release 5.05 or greater.
455	To execute the DPD option, you need an appropriate software license, a rotary telephone and the correct firmware.
456	To execute the ADSI option, you need an appropriate software license and an ADSI telephone.
457	To execute the fax option, you need an appropriate software license, a fax board and a fax machine.
458	To execute the Text to speech option, you need an appropriate software licence and a text to speech board.
459	Press 1 to continue the test, press star to return to the previous menu, press number sign to exit or press 9 to repeat this menu.
460	To execute speech recognition, you need an appropriate software license and a speech recognition board.
461	The WEB application can be executed separately by running NTTEST_WEB.
462	The calling line category is...
463	The successful completion of this application has been logged to the event.log file
464	There is no DNIS, CLID or Calling Line Category information available.

Prompt Number	Prompt Text
465	This is the NTTEST WEB application in voice mode. This application adds two numbers together. Please enter the first number followed by number sign.
466	The calling number is...
467	The DNIS is...
468	Meridian Route Optimization has not occurred.
469	The other party has hung up.
470	To exit, press number sign.
471	To return to NTTEST, press star.
472	If SNMP is properly configured and you have the appropriate software license, you should be able to monitor the SNMP trap using UNIX commands. The trap will read NTTEST SNMP TRAP.
473	The sum is...
474	Please dial ten digits between 1 and 0 on your rotary telephone.
475	Please press 1 to retry the test, press star to return to the previous menu, press number sign to exit, or press 9 to repeat this menu
476	Error. You are not using an ADSI-capable telephone.
477	You have entered...
478	You have selected...
479	Please select a menu item.
480	Press 1 for the Integration Package for Meridian Link test, star to return to the main menu, number sign to exit or 9 to repeat this menu.

Prompt Number	Prompt Text
481	Press 1 for the ADSI test, press 2 for the SNMP test, press 3 for the SCbus transfer via conference test, press 4 for the Meridian Route optimization test, press 5 to retrieve DNIS, CLID, or Calling Line Category, press star to return to the main menu, press number sign to exit or press 9 to repeat this menu
482	Please press the start or send button on your fax.
483	When you hear the beep please press the start or send button on your fax.
484	Please press 0 for the hookflash transfer test, press 1 for the DTMF test, press 2 for the Record message test, press 3 for the fax test, press 4 for the speech recognition test, press 5 for the text to speech test, press 6 for the advanced features sub-menu, press 7 for the applications sub-menu, press 8 for the DPD test, press number sign to exit or press 9 to repeat this menu.
485	After the beep please speak digits zero to nine.
486	Press 1 for discrete recognition, press 2 for continuous recognition, press star to return to the main menu, press number sign to exit or press 9 to repeat this menu.
487	Press 1 for the YES/NO test, press 2 to retry the digits test, press star to return to the NTTEST main menu, press number sign to exit or press 9 to repeat this menu.
488	You said no...
489	You said yes...
490	Please say “yes” or “no” now.
491	Error occurred during speech recognition.
492	The digits spoken are...
493	Please speak digits 0 to 9 between the beeps, up to the number of digits you have said you would enter.
494	Please enter a local telephone number to transfer to, up to seven digits long.

Prompt Number	Prompt Text
495	Press 1 to send a fax, press 2 to receive a fax, press star to return to the main menu, press number sign to exit, or press 9 to repeat this menu.
496	The delete message test failed. Good-bye.
497	Press 1 to retry the test, press star to return to the NTTEST main menu, press number sign to exit or press 9 to repeat this menu.
498	The digits you entered are...
499	Please press up to 11 digits followed by number sign or star on your telephone set.

Loading and using NTTEST

Follow these steps to load and use NTTEST.

1 From the Symposium OPEN IVR Control Panel, select Prompt Loading Facility.

2 Load the prompt range 400–499.

3 From the Symposium OPEN IVR Control Panel, select Application Management.

4 Select `Run script` from the menu.

5 Use the script `nttest_str` to load all NTTEST applications.

Note: The Web Option test requires additional setup, and is not invoked by NTTEST_MN. If you are testing the Web Option, refer to the *Symposium OPEN IVR Web Option Guide* for setup information.

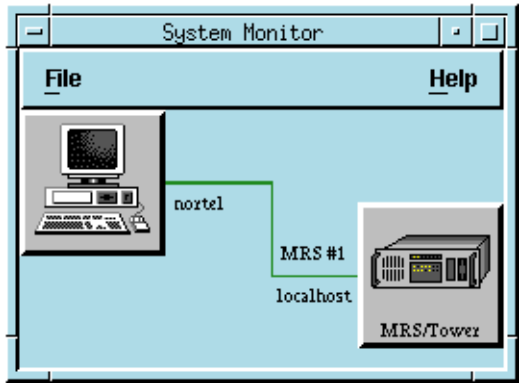
6 Verify the channel alignment

Note: Your system must have been configured already. It should be set to Ring trip, Input, and LoopStart Initialization type as the preferred configuration. Any telephone company changes required would be done through editing of the trunk type files.

a Access the System Administration pull-down menu by pointing and clicking mouse button 1 on the System Administration icon (MRS box with arrows) on the control panel.

b Select the System monitor menu option which will open the System Monitor administration menu. When the outline of a box shows up, move the box to a space on the desktop where you can view it. Select mouse button 1 to show the system monitor.

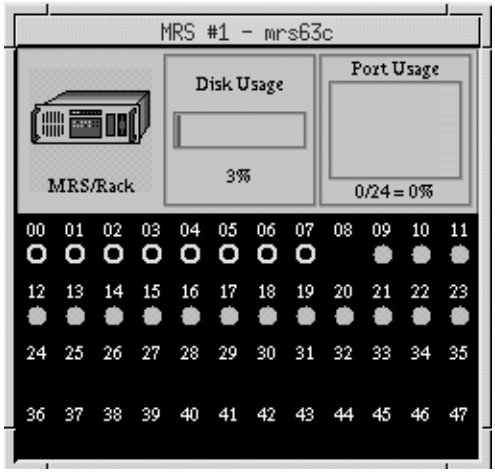
Figure 24-1: System monitor



Note: For more information on how the System Monitor works, please refer to the Release 4.0 *Symposium OPEN IVR System Administration Guide*.

c Select the MRS icon to display the system status window (Figure 24-2). This window contains information on the various channels status.

Figure 24-2: Status Information



A gray ring means outgoing and a gray circle means incoming on the channel monitor. When the application is loaded, the channels assigned, and the application started, the gray circle will change to a yellow ring.

7 Verify/modify the channel alignment

Once the test application is loaded, you can assign channels to the application and enter all incoming channels.

If the channels assigned to the test do not match those currently configured on your system (as seen on your system monitor), make the appropriate adjustments. Else continue to Step 5.

To set channels, follow these steps.

a In the Application Management window, press F3.

b Enter the channel range and press <Enter>.

The channels you enter will be listed in the channel range column of the Application Management screen.

8 Test an application from the NTTEST menu.

Follow the prompts as they guide you through the testing of the application.

9 Stop the test application when you have completed testing.

To stop the test application, run the `nttest_stp` script. This unloads NTTEST and all the sub applications.

10 Exit Application Management.

a To exit Application Management, press <F4> to access the Application Management main menu.

b Select `Exit`. The System Application management window closes.

Check the results

All successful completions of tests are recorded in the `event.log` file in the directory `/u/nortel/log.d`.

Appendix A: Accessing the Service Console Interface

You can access the Service Console Interface (SCI) from a dumb terminal, a modem, or the AP via the Ethernet.

See the following sections:

- "Using a terminal to access the SCI" on page A-2
- "Remote login to the SCI" on page 11-6; Chapter 11 provides information on modem settings as well as a remote login procedure
- "Using the LAN to access the SCI" on page A-3
- "Accessing the SCI on an MRS/AP" on page A-4

Default SCI account passwords

The default SCI account passwords shipped with the system are as follows:

Account	Password	Comment
admin	admin1	site administrators on MRS, AP, and MRS./AP
service	service1	service account on MRS
user	user1	routine maintenance on MRS

Using a terminal to access the SCI

To use a terminal to access the SCI, follow these steps.

1. Connect a video terminal to the MRS system using an appropriate communications cable.

2. Set the terminal parameters as follows:

```
baud rate       2400 or 9600
duplex          Full
data bits       8
stop bits       1
parity          none
add LF          off
```

3. Press <Enter> and the following message is displayed:

```
<system name>
MRS Service Access Port  Revision 4.00
Copyright 1991-1997, Nortel Corp. All Rights
Reserved
Login:
```

4. At the `login:` prompt, enter the appropriate account name. The passwords for these accounts are listed in “Default SCI account passwords” on page A-1.

5. After you log in, the system prompts you for your terminal type. If the default terminal type displayed is correct, press <Enter>; otherwise, type in the correct terminal type (for example, vt100 or ansi).

   Once this is completed, the SCI main menu is displayed.

Using a modem to access the SCI

See “Remote login to the SCI” on page 11-6.

Using the LAN to access the SCI

To access an MRS across a LAN, the MRS must be connected to either an Ethernet or Token Ring network, and the host that will access the MRS must support TCP/IP and `telnet` (or `rlogin`).

To access the SCI using the Ethernet, follow these steps.

1 At the host command line, type the command **telnet *IPaddress*** and press <Enter>, where ***IPaddress*** is the IP address of the MRS.

If the host is an X Window-based UNIX workstation, Nortel recommends that this command be issued from an xterm window.

2 Once the session is connected, the following message should display:

```
login:
```

3 At the `login:` prompt, enter the appropriate account name. The passwords for these accounts are listed in “Default SCI account passwords” on page A-1.

4 After you log in, the system prompts you for your terminal type. If the default terminal type displayed is correct, press <Enter>; otherwise, type in the correct terminal type (for example, vt100 or ansi).

Once this is completed, the SCI main menu is displayed.

Note: On an MRS/AP, if you log in as root, a # prompt is displayed. At the # prompt, type **`sci.start`** and press <Enter> to access the SCI menu.

Accessing the SCI on an MRS/AP

The modem method (page A-2) and the telnet method (page A-3) can be used to access the SCI on an MRS/AP.

Also, if you have direct access to the console of the MRS/AP system, you can log in and access the SCI using these steps:

1. Press the <ALT>, <CNTRL>, and <F1> keys to access the command-line screen.
2. At the `login:` prompt, enter the appropriate account name. The passwords for these accounts are listed in "Default SCI account passwords" on page A-1.
3. After you log in, the system prompts you for your terminal type. If the default terminal type displayed is correct, press <Enter>; otherwise, type in the correct terminal type (for example, vt100 or ansi).

   Note: If you log in as root, a # prompt is displayed. At the # prompt, type **`sci.start`** and press <Enter> to access the SCI menu.

Appendix B: Useful system information

Introduction

This chapter provides useful UNIX information that may be required to install, upgrade, or maintain your system. For additional Unix information, refer to the SCO Unix manuals shipped with your system.

UNIX commands

Listed below are some common UNIX commands and their meanings. Some commands allow parameters (for example, the list command, `ls`, lists the contents of the current directory. To denote a parameter use the minus (-) sign. For example, by using the parameter `-l` you can list the contents of the directory in long form.

cat
display the contents of a file (for example, `cat /usr/lib/a.out`)

cd
changes to another directory (for example, `cd /usr/lib`)

cp
copies one file to another (for example, `cp file1 file2`)

date
displays the current date and time

dfspace
display free space (root use only)

exit
exit out of UNIX

file

display the classification of a file
(for example, `file /usr/lib/a.out`)

format
format a floppy (for example, `format /dev/rfd0135ds18`)

kill
terminate a process (for example, `kill -9 3348`)

manl
displays help for the appended command (For example, `man kill`)

ls -l or l
list the contents of a directory in long form

ls -l | pg
list the directory and pipe, or transfer, the listing to the page command so the listing is displayed one page at a time

mv
renames a file (for example, `mv oldfile newfile`)

pg
display the contents of a file by paging through a file
(for example, `pg /usr/lib/a.out`)

ps -aef
display all processes

pwd
prints the current working directory

rm
remove a file (for example, `rm /tmp/a001`)

rmdir
remove an empty directory (for example, `rmdir /usr/lib/tmp`)

tar cv6
store files on floppy
(for example, `tar cv6 /u/nortel/apps/NTTEST.vpf`)

tar rv6
to add more files to floppy
(for example, `tar rv6 /u/nortel/apps/test.vpf`)

tar tv6

list files on the floppy

tar xv6
extract files from the floppy

ftp command

The `ftp` command is useful for copying files from one server to another over the LAN.

The following example shows how to copy the `/etc/hosts` file from an MRS to a temporary directory on the AP.

1 Log in to the AP as `root`.

2 At the # prompt, type **`ftp`** ***`hostname`*** and press <Enter>, where ***`hostname`*** is the host name of the server you want to connect to. (If the host name is not known, you can use the IP address.)

For example, **`ftp mrs1`**

Screen messages similar to the following example are displayed:

```
Connected to mrs1.
220-
220-MRS Service Access Port
Revision 4.00
220-
220-
220 mrs1 FTP server (Version 2.1WU(1)) ready.

Name (mrs1:nortel):
```

3 At the `Name` prompt, type the account name (the user ID) and press <Enter>.

The password prompt is displayed.

4 Type the password and press <Enter>.

Screen messages similar to the following example are displayed:

```
230 User root logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp>
```

5 At the ftp> prompt, type **bin** and press <Enter>.

The following message is displayed:

```
200 Type set to I.
```

6 Use the get command to copy files from the remote server, or use put to put files onto the remote server.

For example, to copy the /etc/hosts file from the MRS and store it in a /tmp directory on the AP as hosts.mrs, use the following command:

```
ftp> get /etc/hosts /tmp/hosts.mrs
```

The following messages are displayed:

```
local: /tmp/hosts.mrs remote: /etc/hosts
200 PORT command successful.
150 Opening BINARY mode data connection for
/etc/hosts (231 bytes).
226 Transfer complete.
231 bytes received in 0 seconds (0.23 Kbytes/s)
ftp>
```

Note: If copying several files, use the mget command, as follows:

```
ftp> mget /usr/vrs/types/* /tmp/types
```

7 At the ftp> prompt, type **quit** and press <Enter> to exit.

UNIX editors

There are three UNIX editors available for your use — vi, nedit, and scoedit. The nedit and scoedit editors are "pull-down menu" driven editors with a mouse interface and are easier to use than vi. Try to use scoedit and nedit whenever possible. If you use vi, you can use some of the following hints.

Hints on using the UNIX vi editor

Note: The vi editor is case sensitive.

To use the vi editor, follow these steps.

1 Make a copy of the file before editing it.

Type **cp *filename filename.bak*** and press <Enter>, where *filename* is the name of the file to be edited.

2 On the command line, type **vi *filename*** where *filename* is the name of the file to be edited.

3 There are two modes—command mode and insert mode. Command mode allows you to enter commands from within the editor; insert mode allows you to insert information into the file currently being edited. To toggle between modes, use the <Break> or <Esc> key.

4 To navigate through the file, use the following keys:

- h = left
  l = right
  j = down
  k = up
  G = go to the end of the file
  B = go to the bottom of the file
  / *text* = go to the next occurrence of the text you typed in. To look for additional occurrences of this same text, type **/** and press <Enter>.

5 To edit the file, use the following:

- Deleting characters and lines:
  dd = delete current line
  5dd = delete the next 5 lines
  x = delete current character
  X = delete the previous character

- Changing text:
  r = replace one character only
  R = replace characters until the escape key is pressed
  :g/*text*/s//*newtext*/g = make global changes
- Inserting text
  i = insert text before the cursor
  a = insert text after the cursor
  o = open a line below the cursor
  O = open a line above the cursor
- Saving your changes
  :wq = write the changes to the same file and quit the editor
  :wq! = write the changes to a read-only file and quit
  :w filename = write the changes to a different file called filename
  :q! = quit the editor without saving any changes
  ZZ = save all changes and exit from the file

Starting nedit and scoedit

nedit editor

1 To start the nedit editor when logged on as `root`, enter the full path name of where it is located.

At the # prompt, type **`/u/nortel/tools/nedit`** ***`filename`*** where *`filename`* is the name of the file you want to edit.

scoedit editor

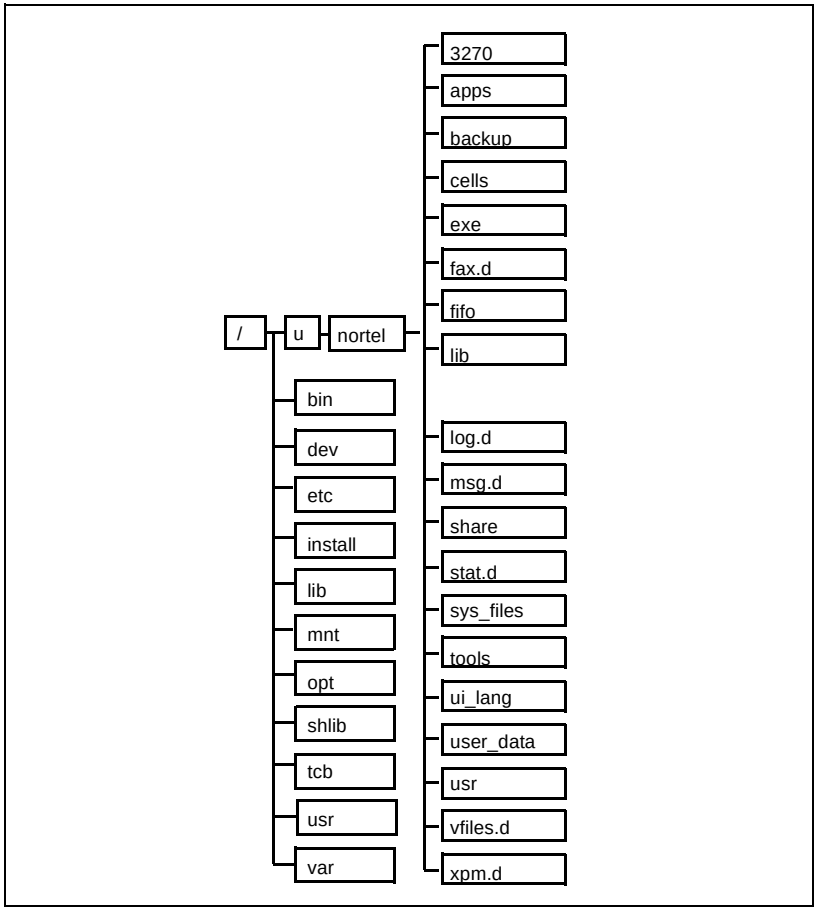
1 To start the scoedit editor when logged on as `root`, enter the full path name of where it is located.

At the # prompt, type **`/usr/bin/X11/scoedit`** ***`filename`*** where *`filename`* is the name of the file you want to edit.

File structure

The following diagram shows the file structure of the /u/nortel directory.

Figure 24-3: /u/nortel directory file structure



Description of AP software directories and files

3270	Screen templates used for host communication.
apps	Directory of applications. Files are in the form of xxxx.vpf.
backup	Stores the backup list file (containing those files designated for backup) that is generated from the backup list tool (xbup).
cells	These are the cells available from which applications can be created.
exe	Executable programs.
sam	Application trace program - shows cell #'s on screen.
smi	Terminal emulator - allows you to test ports.
xxx.sai	sai scripts - reboot.sai (autostart script).
scm	Text system configuration.
sde	Text database editor.
sri	Text reports interface.
plf	Text prompt loading facility.
fax.d	These are the ASCII files that contain embedded fax commands and are specified in the Fax Data File parameter of the SFAX cell.
fifo	Files necessary to run the OPEN IVR 4.0 Console.
lib	These are the libraries that provide needed resources to the user function processes.
log.d	Directory containing log files.
alarm	Minor alarm file.
start.log	Listing of AP software processors running. File is found in the log.d directory.
event.log	Transaction log

msg.d	Directory containing the list of AP software processes that encountered errors - Reset clears them out and renames them to .old.
share	Directory containing the header files that can be used with USER functions.
stat.d	This directory contains the call detail, subscriber, cell usage and trunk usage reports files. These files were previously stored in the /vpf/stats directory.
sys_files	These are the support files that supply the executable AP software with information about the environment including process names, system configuration, voice storage allocation, etc. Message and information database files also reside in this directory.
tools	These are the software tools used for AP software setup and maintenance.
usr	User function C code.
ui_lang	The user interface language directory which supports the customization/internationalization feature. You can customize items (such as icons, user interface language files, error string files, and help text) in the ui_lang directory for a particular language or special release.
user_data	These are the files that customize the environment to provide for the automatic execution of AP software.
vfiles.d	This is the default directory where files that are copied from the MRS via the PLF are stored. These files were previously stored in the /vpf/vfiles directory.
xpm.d	This directory is used for the temporary storage of prompts during prompt editing.

Kernel parameters

The following table lists the parameters that are modified and relinked with the kernel during the install or upgrade of the AP software. This list is not displayed.

Parameter	Value	Comments
NREGION	700	Number of regions allocated
NINODE	500	Maximum number open inodes system wide
NFILE	500	Maximum number of open files system wide
NS5INODE	500	Must be the same as NINODE
NCALL	100	Call out table size
NCLIST	400	Number of character list buffers
NPROC	200	Maximum number of processes system wide
MAXUP	60	Maximum number of processes per user
MSGMNB	65535	For System V Message Queues
MSGSEG	16384	For System V Message Queues
MSGTQL	1024	For System V Message Queues
NSTREAM	168	Maximum number of stream head buffers
NQUEUE	800	Maximum number of stream queues
NBLK4096	20	Maximum number of 4096 byte stream buffers
NBLK2048	40	Maximum number of 2048 byte stream buffers
NBLK1024	48	Maximum number of 1024 byte stream buffers
NBLK512	72	Maximum number of 512 byte stream buffers
NBLK256	300	Maximum number of 256 byte stream buffers
NBLK128	450	Maximum number of 128 byte stream buffers
NMBLK64	400	Maximum number of 64 byte stream buffers
NBLK16	200	Maximum number of 16 byte stream buffers
NBLK4	256	Maximum number of 4 byte stream buffers
SHMMAX	2024000	Maximum amount of shared memory
SHMALL	2024	Maximum amount of shared memory
FLCKREC	500	Number locks system-wide
NMUXLINK	64	Maximum number of multiplexer links
NSTRPUSH	9	Maximum number of modules on stream
NSTREVENT	256	Maximum init stream event structures
MAXUMEM	8192	Maximum - memory pages allocated to user
SEMMSL	35	Number of semaphores per id

Appendix C: Installing the cabinet and rack-mountable components

Introduction

This chapter provides information on installing a cabinet to hold your Symposium OPEN IVR hardware components. This chapter is divided into the following sections:

- "Section A: Installation planning and component installation" on page C-2

  Read this section to prepare for cabinet installation. Also refer to this section to assist you in installing servers and peripherals in the cabinet.

- "Section B: Installing the cabinet" on page C-18

  Follow the procedures in this section to install the cabinet.

Section A: Installation planning and component installation

Introduction

Read this section to assist in installation planning. This section describes the cabinet, requirements, and the rack-mountable components.

After the cabinet is installed, refer back to this section to assist you in installing servers and peripherals in the cabinet.

Description

The 187.96 cms. (74 inches) high, 70.00 cms. (27.56 inches) wide and 80.16 cms. (31.56 inches) deep cabinet houses the server and other rack-mountable components. If required, multiple cabinets can be provisioned with rack-mountable components variably positioned to accommodate a multiple server arrangement. Restrictions apply to the cabling and placement of monitor and keyboard drawers for easy access by users. Vertical flanges can be mounted on the inside of the cabinet to accommodate smaller 19-inch mountable components, such as the server and switch-boxes. Support rails and panels are required for the support of each component. The vertical mounting positions of the support rails are not fixed, add multiple rails as required for the vertical spacing of rack components. The rack components may also be concealed from view by front and rear cabinet doors.

Cooling

The cabinet does not provide any additional cooling. Chassis cooling is provided only by the server and other rack-mounted components within the rack mount chassis. Air intake from the rack-mountable units occurs from the front and side, and ventilates to the back of the cabinet.

Space requirements

Front and rear access room is required for servicing of rack components. Situate the cabinet in an area with enough space for the front and rear cabinet doors to open and close, and allow extra access room for service or removal of any rack-mounted component.

Cabinet configuration

Cabinet	Description
Weight	136.7 kgs (300 lbs) without pallet and electronic equipment
Loading capacity	136.7 kgs (300 lbs) of equipment (evenly distributed horizontally
Centre of gravity	96.52 cms. (38 inches) measured vertically from the bottom
Electrical requirements	non EMI/RFI shielded
Cabinet outside dimensions	187.96 cms (74 inches) high, 70.00 cms (27.56 inches) wide, 80.16 (31.56 inches) deep (according to EIA standard)
Cabinet aperture dimensions	178.10 cms. (70.12 inches) high, 61.11 cms (24.06 inches) wide, 80.16 (31.56 inches) deep (according to EIA standard)
Vertical flange mounting dimensions	when vertical flanges are mounted, the following component mounting dimensions are allowed: 45.24 cms (17 (13/16) inches) wide, 178.44 cms (70 (1/4) inches) vertically from top The basic cabinet can support other flange mounting configurations.
Vertical flange hole spacing	EIA standard for universal attachment hole patterns
Server dimensions	26.67 cms (10.5 inches) high, 43.18 cms (17 inches) wide, 46.09 cms (17.75 inches) deep
Servers per cabinet	primary cabinet: up to three secondary cabinet: up to four
Switch-box dimensions	4 and 8 channel switch: 48.26 cms (19 inches) wide, 20.32 cms (8.0 inches) deep, 4.51 cms (1.75 inches) high typically.
Switch-box capacity	4 and 8 channels
Video enclosure dimensions	43.18 cms (17 inches) wide, 45.72 cms (18 inches) deep, and 35.56 cms (14 inches) high

Cabinet	Description
Keyboard and mouse tray dimensions	48.26 cms (19 inches) wide, 8.89 cms (3.5 inches) high, 51.82 (20.4 inches) deep.
Power distribution	AC or DC supported

Server mounting

Description

The server is rack mounted and can be slotted into a cabinet to a depth of 48.90 cms (19.25-inches), and to a slot height of 31.75 cms (12.5 inches). The server is attached to the cabinet by the server rack rails. For support and stability, the server requires angle support rails to allow the server to be drawn out of the cabinet if the server is removed or serviced. It has dual-redundant and rear-accessible hot-swappable power supplies and two fan units that do not require the server be drawn out or removed from the cabinet.

Up to three servers may be installed into the primary cabinet. Install support rails for each server slotted into the cabinet. Mount the server with the front facing the front of the cabinet to allow power, video, and network cables to exit at the back of the cabinet. This positioning also allows cooling air to enter the server at the front and exit at the back.

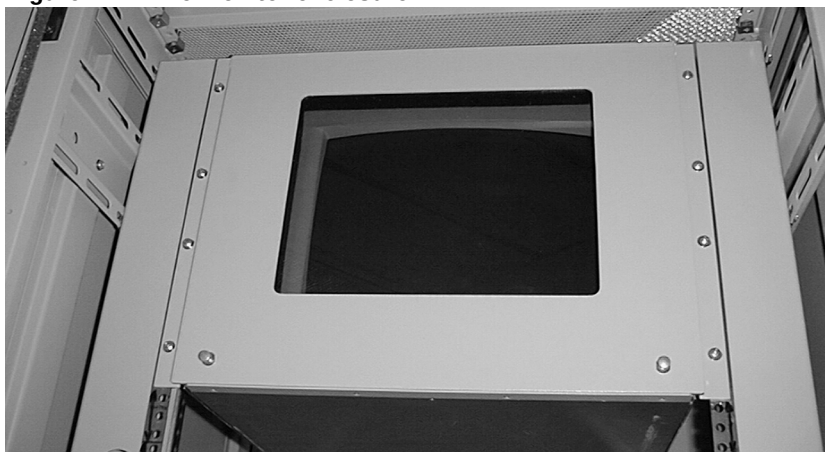
Mechanical considerations

Standard vertical flanges are used for the cabinet. When mounted they allow a maximum mounting width of 46.09 cms (17.75 inches) for a vertical region of 178.44 cms (70.25 inches) from the top. The flanges have bolt holes that are 0.79 cms (5/16 inches) in diameter. The bolt holes are 0.64 cm (1/4 inch) from the edge to hole centre. The bolt holes are spaced according to the EIA standard for hardware attachment. They are spaced along the edge of the flange by two distances only that measure 1.27 cms (1/2 inch) minimum to a maximum of 1.59 cms (5/8 inches) apart. Therefore there may be up to a 1.27 cm (1/2 inch) to 1.59 cm (5/8 inch) mounting gap between rack components to accommodate protrusions such as switch-box feet.

Monitor enclosure

The rack-mount monitor enclosure securely holds a desktop monitor within an equipment rack mount. The back of the enclosure is open to ventilation, and access to the signal and power connections. The front door is secured by two paw latches and may be removed and replaced to adjust to the front panel controls of the monitor. It is a 19-inch mount component which adjusts to most 14-inch desktop monitor designs. Foam bezel on the door blocks any penetration of rear light through the visual opening. The enclosure centers the monitor screen into the opening, three clamping bars secure the monitor position.

Figure 24-4: The monitor enclosure



Keyboard drawer enclosure

The keyboard drawer enclosure is mounted to the cabinet with slide mount rails under the monitor enclosure, or under one server computer unit not in excess of one foot. This 19-inch rack-mounted component provides storage space for any full-size keyboard, mouse, or track ball. When extended, the keyboard locks into position for stability.

Figure 24-5: The keyboard drawer

Switch box

A switch box can control up to eight servers. A cabinet configuration can hold a maximum of seven servers. Therefore, the switch box that is provisioned as part of the cabinet can control up to seven servers with one keyboard, mouse, and monitor. A four or eight channel switch box may be provisioned depending on the number of servers required. The switch box allows a mixture of servers with PS/2 and serial mouse ports, VGA, SVGA, XGA high resolution video, hot-key commands and front panel button operation, SCAN monitoring, and SKIP to filter unused channels. The box dimensions are 48.26 cms (19 inches) wide, 19.99 cms (7.87) inches deep, and 4.45 cms (1.75 inches) high. Cables with lengths of 2 meters (6.5 feet) and 4 meters (13 feet), a single-unit rack-mounting kit.

Multiple cabinet configurations

The primary cabinet can accommodate a maximum of three servers per unit including all extra required components. If the number of extra servers required exceeds three, the extra must be provisioned on a secondary cabinet. The recommended component assignments for single-and multiple-cabinet configurations are shown in “Multiple-cabinet component assignments” on page C-10.

The recommended placement of components for the secondary cabinet is similar to the primary cabinet with the exception of the fourth server, which may be placed directly above the third server. The cabinet has a standard vertical flange that allows a maximum width for the mounting of 48.26 cms (19-inch) rack components. The maximum width of rack-mounted components is 45.09 cms (17.75 inches) that extends to 173.99 cms (68.5 inches) from the top of the cabinet aperture downward.

Multiple-cabinet component assignments

Components	Width (maximum)	Primary rack		Secondary rack(s)	
		Used	Recommended height spacing	Used	Recommended height spacing
Switch-box	17 (13/16) inch	X	2.0 inches		n/a
Video enclosure	17 (13/16) inch	X	15.0 inches		n/a
Keyboard/mouse drawer	17 (13/16) inch	X	4.0 inches		n/a
Server	17 (13/16) inch	X	14.0 inches	X	14.0 inches
Server	17 (13/16) inch			X	14.0 inches
Server	17 (13/16) inch			X	14.0 inches
UPS (AC systems only)	23 (5/16) inch	X		X	
Total height	17 (13/16) inch	n/a	35.0 inches	n/a	42.0 inches
Total height	23 (5/16) inch	n/a	18.0 inches	n/a	18.0 inches
Spare height	17 (13/16) inch	n/a	8.25 inches	n/a	1.25 inches
Spare height	23 (5/16) inch	n/a	5.3 inches	n/a	5.3 inches

Safety and reliability

For stability and safety of operation, stack servers in the cabinet from the base toward the top of the cabinet. This ensures that the cabinet centre of gravity does not exceed 96.52 cms (38 inches) measured vertically from the bottom.

Cabling

You require the following cable types for components and peripherals mounted in the cabinet:

- PS/2 mouse, PS/2 keyboard, and VGA connections to the switch boxes and servers. The recommended cable lengths are 2 and 4 meters to accommodate all configurations.
- cables to monitor/keyboard and mouse from the switch box.

See “DC wire gauge tables” on page C-15 for additional information.

Slack requirements

Cables for network and power supplies must be slack to allow the cabinet mobility in the operating environment. This refers to cables that are externally mounted and that go to or from the cabinet.

Secure cables

Secure cables into the cabinet along the cable conduits which are accessible at the rear of the cabinet. The cables are typically guided along the conduits and secured using attached plastic ring snaps. The cable conduits extend to the full height of the cabinet and exit through the top-rear section of the cabinet through conduit cable holes. The cabinet top plate has a pair of 3.18 cms (1.25-inch) and 1.91 cms (0.75-inch) combination conduit hole knock-outs on the top perforated section for terminating conduit fittings if cabling is required overhead. The cabinet bottom section has a pair of 5.08 cms (2.0-inch) diameter holes for bottom/rear cable entry.

Cabinet component expansion

The cabinet can be expanded by adding more cabinets in support of more servers and power supplies required for the system. In the event of a cabinet expansion, hardware such as support rails, panels, and vertical flanges must be ordered and sized for the expansion configuration.

Server expansion

The primary cabinet can contain up to three servers. The cabinet is not pre-wired to accommodate the maximum of three servers. If one cabinet is expanded to include more servers in available space, then the necessary wiring must be provisioned. If more than three servers are required, then a secondary cabinet must be provisioned.

Equipment handling

Guidelines

- The cabinet has custom-made unloading ramps stored inside the shipping pallet. Follow instructions provided with the ramps to slide the cabinet into position.
- External power equipment, such as an uninterruptible power supply (UPS), is often very heavy. The equipment requires special handling procedures and additional personnel for unloading and installation. Be aware of weight distribution and keep the equipment room floor from being overly stressed.

DANGER

Risk of electric shock

Avoid the danger of electric shock; be careful when you work with power equipment and connections. Displayed warning notices must be heeded.

CAUTION

Risk of equipment damage

Never lift the access module column by prying up the pedestal. To avoid major damage to the pedestal, manually slide the column down the ramps provided.

Power and grounding guidelines

Safety information

As a safety precaution, locate all AC service panels in an area that is easily accessible at all times to allow for emergency shutdown. Additionally, clearly mark each AC circuit breaker to identify the system component or components that it services. For AC-powered systems, an ideal location for the service panel is near or just outside the entry to the room containing the cabinet. In DC systems, locate the service panel near or just outside the entry to the room containing the DC power system that supplies the rack-mounted equipment.

DANGER

Risk of electric shock

Procedures involving electrical connections must be performed by qualified persons only.

Note: If your AC service panel is inside the switchroom and the switchroom doors are controlled by a card or badge reader, be sure you have a way to enter the switchroom if the power goes out.

Safety ground and logic return wiring in all cabinets

Each cabinet requires separate safety ground/protective earth connection. The safety ground wire must be an insulated green wire. Use #10 AWG for the cabinet. The cabinet has one ground connection that provides both safety ground and logic return.

Figure 24-6: Ground connection

Guidelines on daisy-chaining ground wires in AC and DC cabinets

- Daisy-chaining ground wires is not permitted between multiple cabinets.
- Multiple columns of access modules use a logic return equalizer (LRE) as the point where the logic return wires from different columns are consolidated before connecting to the single-point ground.
- The LRE used with the MFA150 and System 600/48 is a copper bus bar mounted in the control/distribution panel of the power system.
- In DC-powered access modules powered by an MFA150 power plant, the safety ground is daisy-chained between columns and then run directly to the ACEG in the service panel.

- In DC-powered access modules powered by a System 600/48 power plant, safety ground is daisy-chained between columns and then run to the ACEG. The System 600/48 is connected to the AC panel through the AC input conduit.

ATTENTION

The System 600/48 power plant is used as an example only. There are other models in addition to this.

DC wire gauge tables

Overview

The tables in this section specify the DC power feed wire requirements.

Table 24-3: Cabinet and module DC feed recommended wire gauge specifications

Length	#10 AWG	#8 AWG	#6 AWG	Junction Box #4 AWG	Junction Box #4 AWG
0-30 m (100ft)	yes	yes	yes	yes	yes
0-45 m (150ft)	no	yes	yes	yes	yes
0-75 m (250ft)	no	no	yes	yes	yes
0-135 m (450ft)	no	no	no	yes	yes
0-210 m (700ft)	no	no	no	no	yes
Over 210 m (700ft)	no	no	no	no	no

Note 1: Cabinet and module ground wire specification is #10 AWG insulated green safety ground wire.

Note 2: Cabinet conduit can be 1.91 cms (3/4 in.) or 3.18 cms (1-1/4 in.) and must be insulated from cabinet ground.

Table 24-4: Access module DC feed recommended wire gauge specifications

Length	#8 AWG	#6 AWG	Single #4 AWG	Double #4 AWG
0-3 m (10 ft)	yes	yes	yes	yes
3-6 m (20 ft)	yes	yes	yes	yes
6-9 m (30 ft)	yes	yes	yes	yes
9-12 m (40 ft)	yes	yes	yes	yes
12-15 m (50 ft)	yes	yes	yes	yes
15-18 m (60 ft)	no	yes	yes	yes
18-21 m (70 ft)	no	yes	yes	yes
21-24m (80 ft)	no	yes	yes	yes
24-27m (90 ft)	no	no	yes	yes
27-30m (100 ft)	no	no	yes	yes
30-60m (200 ft)	no	no	no	yes
over 60m (200 ft)	no	no	no	no

Table 24-5: Metric wire conversion

AWG No.	Industry standard nominal (sq mm)	Resistance at 20 deg. C (Ohm/100 m)
2	35	0.05
4	25	0.08
6	16	0.13
8	10	0.20
10	6	0.33
12	4	0.63
14	2.5	1.00
16	1.5	1.40
18	1	2.00
20	0.75	2.90
22	0.5	4.60

Section B: Installing the cabinet

Positioning and leveling the cabinet

Overview

This section contains the procedures for positioning and securing a cabinet. It assumes you have completed the pre-installation tasks and site-planning.

DANGER

Risk of personal injury

If your cabinet was shipped in a horizontal position on its pallet, it requires three people to lift the cabinet to an upright position for unpacking.

Procedure for installing a cabinet

1. If your cabinet is still in its shipping carton, remove the carton and shipping material as shown in the diagrams on the carton. Retain the packing list.
2. Remove and discard the shipping bolt that secures the cabinet to the pallet.
3. Slide the cabinet off the pallet using the ramps provided into position on the floor (follow the floor plan or floor markings).
4. Compare the packing list to the sales order. Report any differences to your supervisor.
5. Dispose of shipping material according to your company's procedures.

Requirements

- a drill
- 1/2-in. stabilizing rods
- four angle brackets

Installing seismic kit or stabilizing rods (if required for site)

Note: If you are not installing bracing, go to step 3 now.

1. Drill holes in the floor or sub-floor.
2. Install 1/2 in.-stabilizing rods in the holes.
3. Position the cabinet so that the rods terminate in the seismic cutouts in front and back of the cabinet.
4. Install four angle brackets under the cabinet.
5. Secure the stabilizing rod to the angle bracket using the four insulated ground shoulder washers provided.

Removing a cabinet door

1. Open the door using the key provided with the cabinet.
2. Disconnect the cabinet alarm LED by unplugging the RJ11 connector at the rear upper corner of the door.
3. Lift the door off the hinge and set the door aside until cable installation is complete.

Positioning and leveling the cabinet

1. Place a level on top of the cabinet.
2. Use a heavy duty screwdriver to raise and lower the cabinet feet until the cabinet is level. Turn the screwdriver clockwise to raise a foot, counterclockwise to lower a foot.

Figure 24-7: Levelling feet

What's next?

Installing power and ground in a rack-mount cabinet

Installing power and ground in a cabinet

These instructions explain how to connect power and ground wires in DC cabinets and the ground wire and power cords in AC cabinets.

Before you begin

1. Complete the pre-installation tasks and have the tools described below.
2. Read the section "Power and grounding guidelines" on page C-13.
3. Read the section "DC wire gauge tables" on page C-15.

4 A cabinet equipped with a UPS must have a power outlet rated for 50 Amperes.

CAUTION

Risk of equipment damage

- Failure to follow grounding procedures can result in unsafe or faulty equipment. See “Power and grounding guidelines” on page C-13 for a complete description of approved ground sources and methods.

- Never hard-wire an AC cabinet. The design of the module power distribution assembly prohibits anything but a cord/plug configuration to deliver AC voltages to the modules.

Each AC-powered module must be powered by an individual receptacle with a dedicated circuit breaker. Never plug module AC power cords into a power strip or quadruple receptacle.

Tools required

- level
- ladder
- tie-wraps of assorted sizes
- hand-held device to make cable labels
- socket wrench
- heavy-duty Phillips and standard screwdrivers
- pliers

Pre-installation tasks

The following serves as a guideline. Specific requirements may differ at each site. Ensure that the following is done:

- Specify a location for the cabinet.

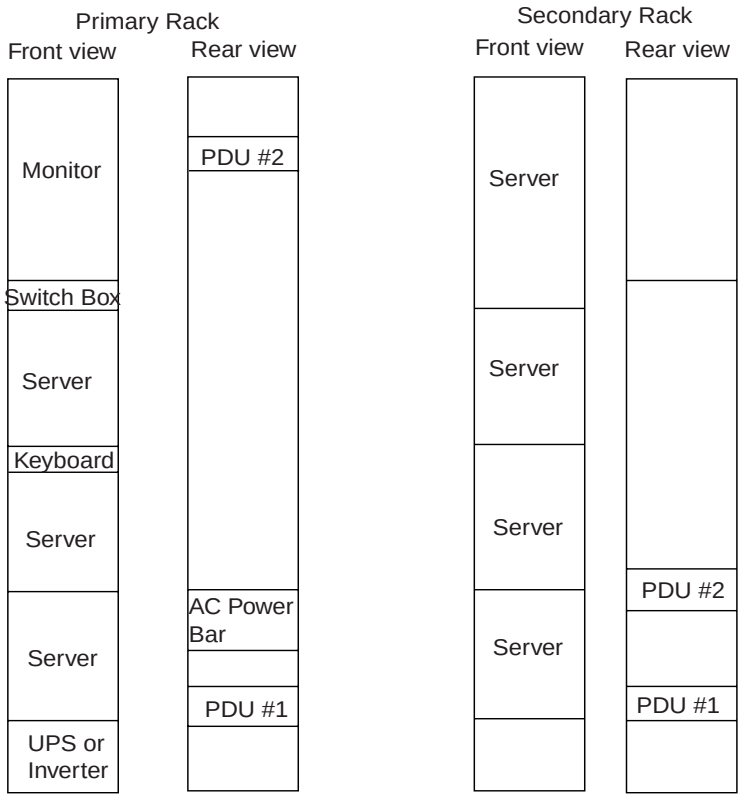
- Install and test AC receptacles according to local power codes and regulations, if installing AC-powered equipment.
- Ensure that there are four 15 Ampere AC power outlets for two fully loaded cabinets.
- Each fully loaded cabinet requires two power bars. Ensure that they are available or installed. Each power bar must plug into a separate 15 Ampere wall outlet.
- Install and test a DC power plant according to the manufacturer's documentation, if installing DC-powered equipment and cabinets. Retain the documentation.
- Ensure that Local Area Network "drops" are installed in the switchroom.
- Install and test Uninterruptible Power Supply or backup batteries if reserve power equipment is specified. The manufacturer's documentation must be used to install this equipment.

The Power Distribution Unit

Overview

A Power Distribution Unit (PDU) is installed in a cabinet that has DC powered servers. Power from the DC supply source enters the PDU and can then be distributed to one or more servers. A single PDU can supply DC power to four DC power supply modules. A server may have either one or two power supply modules installed. The number of PDUs to installed in a cabinet can be determined by counting the number of power supply modules in each cabinet. A PDU is always installed at the rear of the cabinet. See Figure 24-8 on page C-23 for the location where each PDU is required to be installed in a cabinet.

Figure 24-8: PDU location on a cabinet



Modems

If modems are required, they are always located on the equipment shelf at the bottom of the cabinet.

Description

A PDU consists of eight terminal blocks within a metal enclosure. Before installing the PDU, connect the terminal blocks with wires 1, 2, 3, 4, 5, and 6 as shown in Figure 24-9 on page C-24. Use AWG 12 wires for these connections.

Figure 24-9: Single PDU wiring diagram

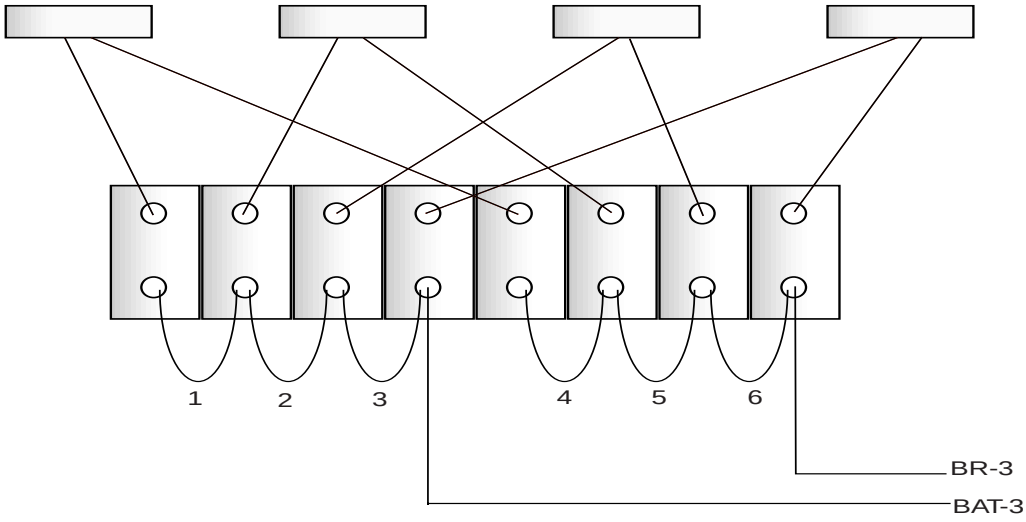
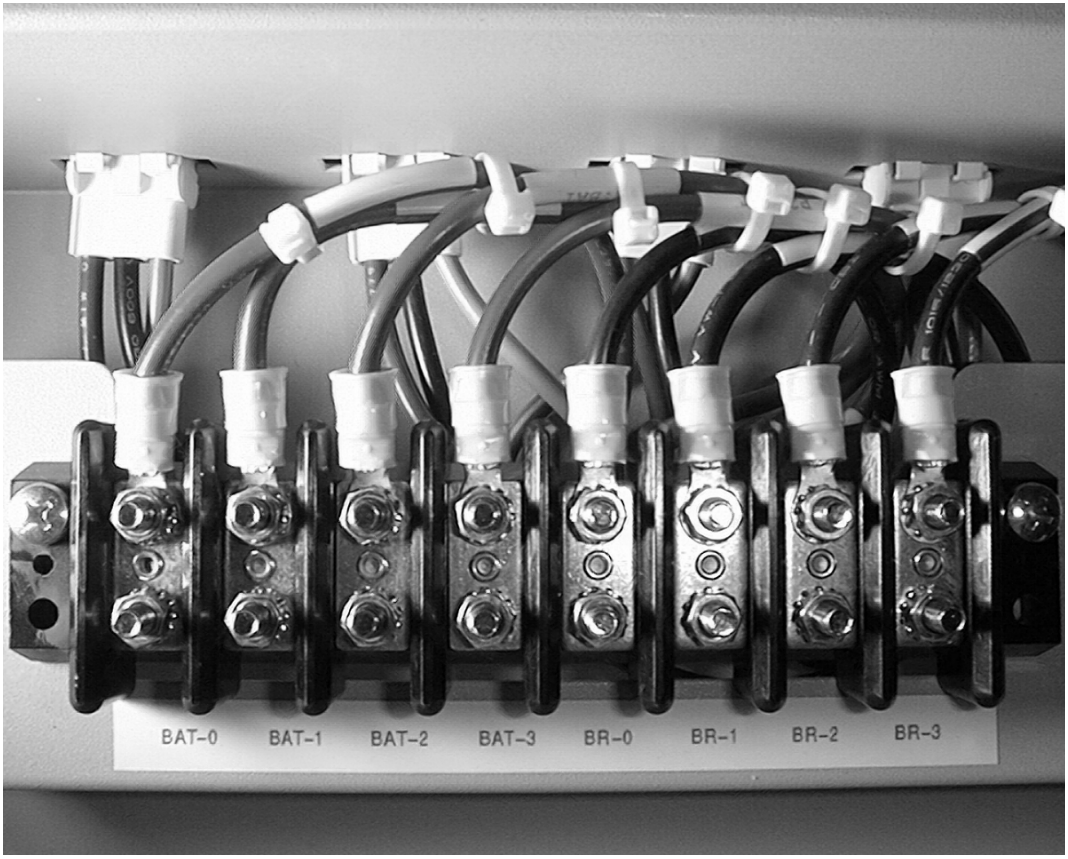


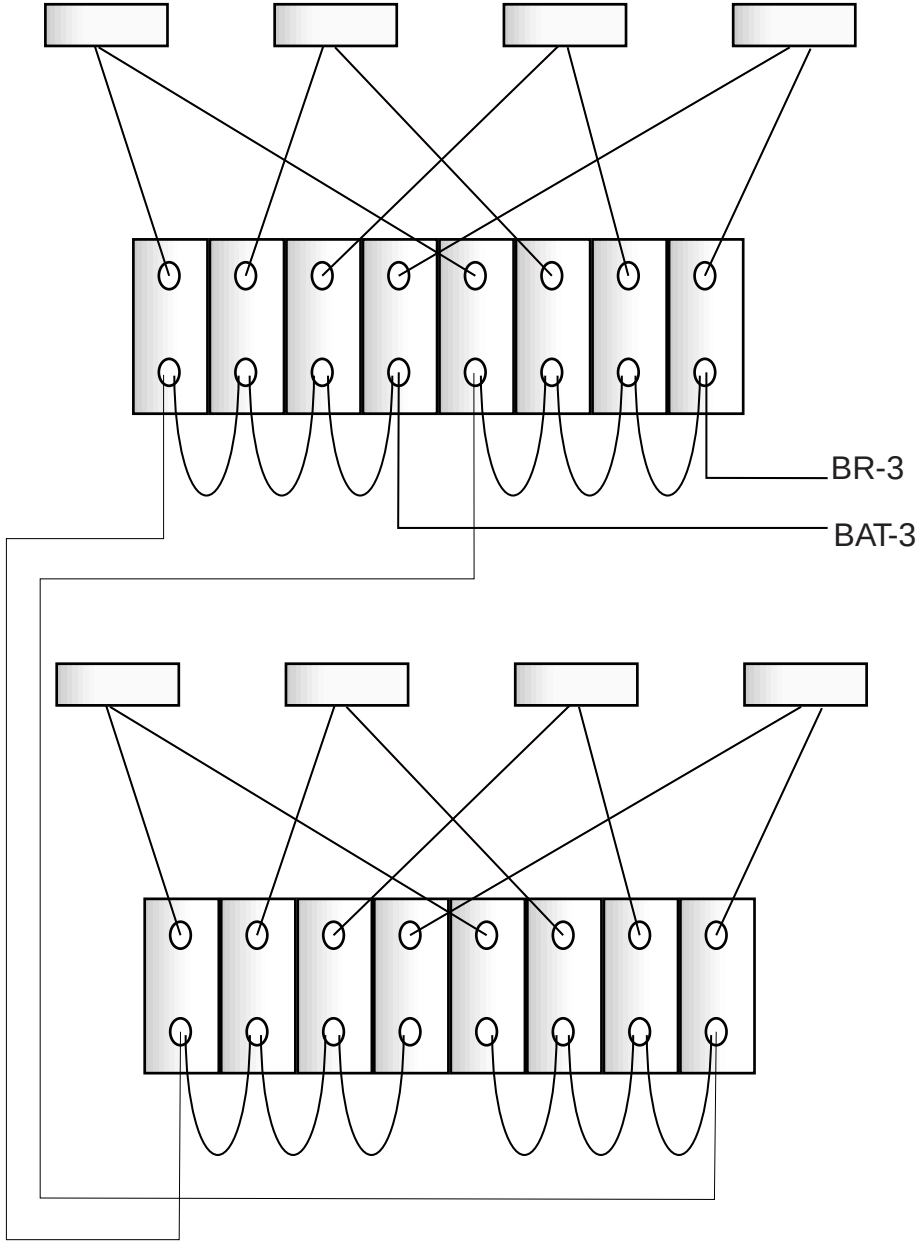
Figure 24-10: Wiring block in the PDU



Multiple PDUs

In cabinets where more than four power supply modules are installed a second PDU must be installed. They can be connected as shown in Figure 24-11 on page C-26.

Figure 24-11: Multiple PDU wiring diagram



DC Power input

DC power input into the distribution unit connects to BAT-3 and BR-3. Refer to the previous figures for the location of these terminals. Connect the input wires before installing the PDU on the cabinet.

Install the PDU

The PDU is installed at the rear of the cabinet. Refer to Figure 24-8 on page C-23 for the location of the PDU you are installing. The PDU is secured to the cabinet with four screws.

Power cords and ground wire (no UPS)

To install power cords and ground wire, follow these steps.

1. Select a dedicated outlet that meets local electrical code specifications (for example, 110 VAC in the U.S. and 220 VAC in Europe) to supply each module in the cabinet.
2. If desired, route AC cords into the cabinet using conduit knockouts found on the top rear of the cabinet.
3. Connect a #6mm lug on one end of the #10 green ground wire. Use a socket wrench to loosen the ground stud nut. Loop the lug end of the ground wire around the stud and tighten the nut. Connect the other end of the ground wire to the AC equipment ground (ACEG) source.
4. Standing at the rear of the cabinet, unscrew and retain the plate at the bottom of the modules.
5. Connect the female end of one AC cord into each module power distribution assembly. Route cords down and toward the rear of cabinet.

   Note: You may see a ground stud on the module power distribution assembly. *Do not* attach anything to it. Modules inside cabinets are grounded using the cabinet ground.

6. Replace the module plates and make sure the cord routes under the cutout on the plate.

   Note: *Always* replace module plates. They are very important to ensure proper airflow management in the cabinet. Do not plug the cord into the receptacle yet.

7 Measure ground continuity by connecting one multimeter lead to the ground stud and the other lead to the ground pin on each power cord. Ground measurement should be 0--0.5 ohms.

Bring power and ground into cabinet terminal block

Introduction

Install BAT/BATRTN wires in pairs. Each pair of wires supplies voltages to a module through a power harness. The module harnesses are installed in the cabinet power distribution assembly and connected to the modules at the factory.

- BAT0 (-)/BATRTN0 (+) feeds INS power supply 0 (right power supply)
- BAT1 (-)/BATRTN1 (+) feeds INS power supply 1 (left power supply)
- BAT2 (-)/BATRTN2 (+) feeds Module 1 (top position in cabinet)
- BAT3 (-)/BATRTN3 (+) feeds Module 0 (center position in cabinet)

Installing DC power and ground

To install DC power and ground, follow these steps.

1 If you are using a conduit, terminate the 1-1/4 or 3/4 conduit at the top rear of cabinet or the bottom front of the cabinet using the knockouts provided. The number of wire pairs you can run in each conduit depends on the wire gauge.

Note: To preserve ground integrity, the conduit must be insulated.

2 Select a power feed with a circuit breaker dedicated to each module and identify it with an appropriate tag.

Note: Information about strapping will be provided in a later issue.

3 Select a wire size to suit the required feed length from the power source (see “DC wire gauge tables” on page C-15).

4 Using pliers, strip one-quarter to one-half of the insulation from one end of all power and ground feed wires.

5 Undo the terminal block screws at (-) positions 0, 1, 2, and 3. Insert the Red wires into terminal block positions 0, 1, 2 and 3. Secure the wires in the terminal block by tightening the screws.

6 Undo the terminal block screws at (+) positions 0, 1, 2, and 3. Insert the black wires into terminal block positions 0, 1, 2, and 3. Secure the wires in the terminal block by tightening the screws.

7 Select a #10 green wire safety ground. Attach to cabinet (to be determined-ground stud still being designed).

8 Measure the module ground continuity by touching one multimeter lead to any BATRTN terminal block connector and the other end to the GND terminal block connector. Measurement should be between 0--0.5 ohms.

Telescoping slide rails

Overview

Telescoping slide mount rails are used to mount the server and the keyboard drawer. These rails make it possible to pull the server or keyboard drawer out from the cabinet to the extent that the rails permit. When fully extended the rails have a locking mechanism that locks the keyboard drawer or the server into position for stability. Do not pull more than one server from the cabinet at a time. The cabinet may tip over and cause personal injury or damage to equipment.

Description

A telescoping slide mount for a server consists of the following main sections:

- Cabinet section - this is screwed onto the front and rear vertical flanges of the cabinet. It remains stationary.
- Central or intermediate section - this section moves with server chassis whenever you slide it in or out. It must be inserted into the Cabinet section before the “L” end bracket is attached.
- Server or chassis section - this is screwed onto the server chassis. It remains stationary. An adjustable “L” end bracket must be screwed on to the cabinet section before it is attached to the cabinet. All screws, bar nuts and snap-on nuts required are provided with the telescoping slide rails as a kit.

Requirements

- slide rail kit
- Phillips screwdriver

Figure 24-12: Telescoping slide rail on the keyboard drawer

Installing slide rails for the server

To install rails for the server, follow these steps.

1 Count the holes on the vertical flange of the cabinet. Start from the top hole. Count it as 1 and continue down the flange. Mark the following holes:
For Server # 3 on the primary cabinet: 41 and 44
For server # 2 on the primary cabinet: 64 and 67
For server # 1 on the primary cabinet: 85 and 88.

2 Mark the above holes on the other three vertical flanges of the cabinet.

3 Slide the central section into the cabinet section. Refer to the picture below.

Note: The central section can be inserted into the cabinet section in one way only. The notched end is to the rear.

Figure 24-13: Slide rail - central section

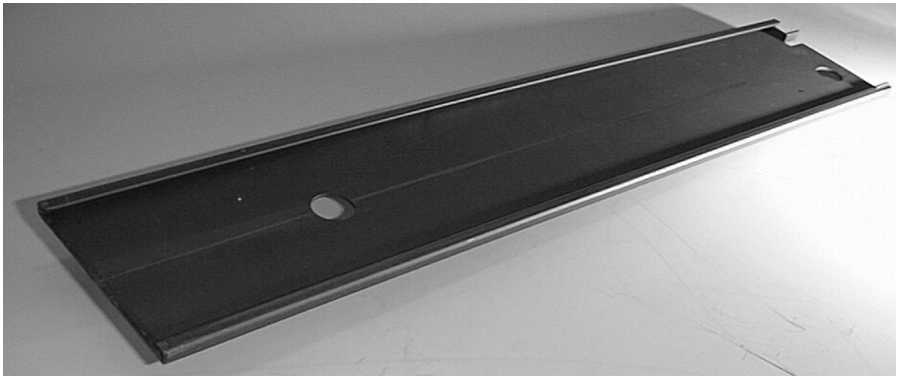
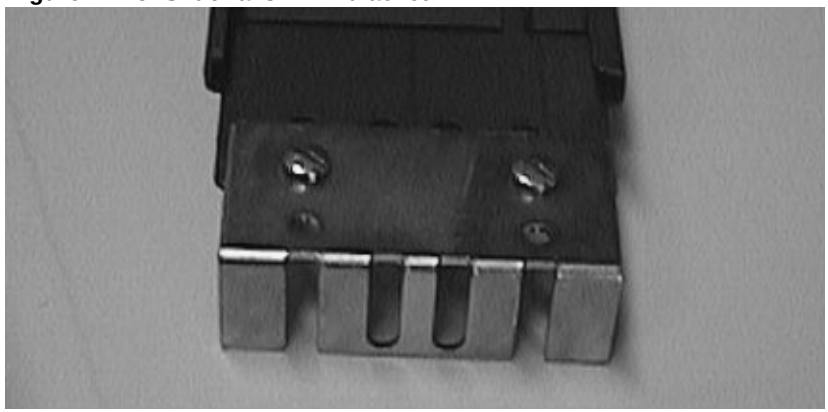


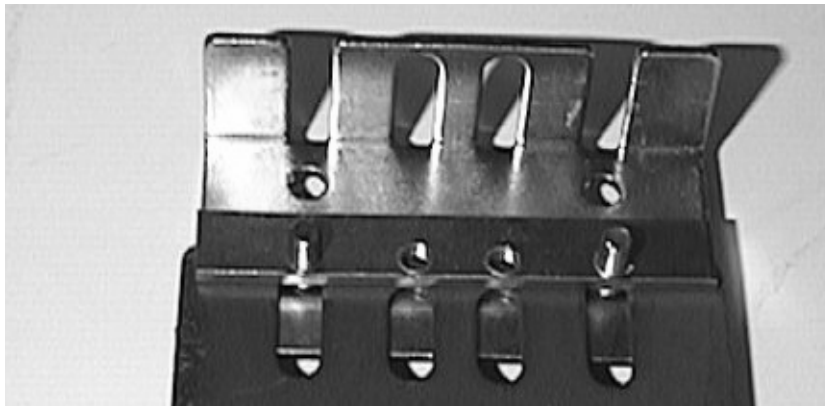
Figure 24-14: Slide rail - cabinet section

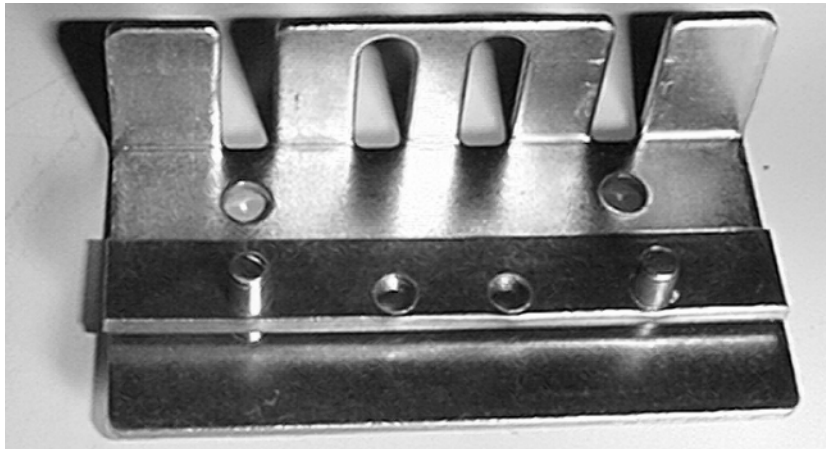
4 Screw the “L” shaped end bracket to the cabinet section. Refer to the pictures below.

Note: A bar nut must be placed as shown in the second picture below. Do not tighten the screws. The exact position of the “L” bracket on the cabinet section must be adjusted while screwing the cabinet section onto the vertical flange.

Figure 24-15: Slide rails - “L” bracket

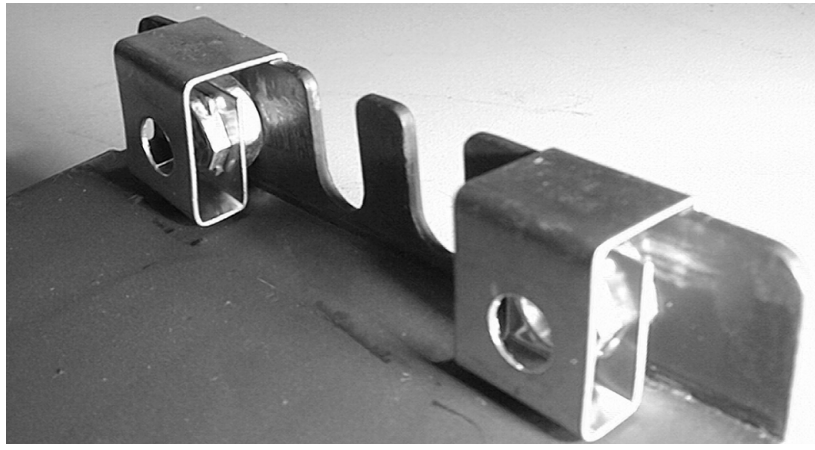






5 Attach two snap-on nuts to the portion of the cabinet section of the rail that attaches to the front of the cabinet. Refer to the pictures below.

Figure 24-16: Snap-on nut installed on the cabinet section and the vertical flange



6 Attach two snap-on nuts to the relevant holes marked on the rear vertical flange. For hole numbers refer to step one of this procedure.

7 Screw the assembled cabinet section, to the front and rear vertical flanges on the cabinet.

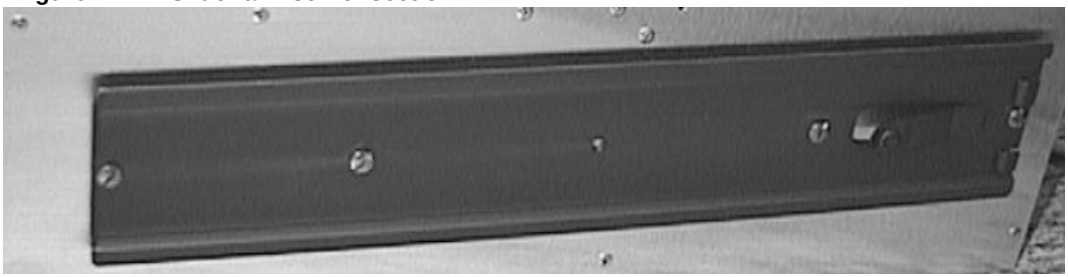
Note: The cabinet section must be screwed onto the vertical flange at the front of the cabinet with its teeth behind the vertical flange. The teeth go behind the vertical flange at the rear of the cabinet.

8 Repeat steps 4, 5, and 6 to install the slide rail parallel to the current one.

9 Fasten the server section onto the server chassis with the four Phillips screws provided. Refer to the picture below.

Note: The metal catch should be at the rear of the chassis.

Figure 24-17: Slide rail - server section



10 Extend the central section on the cabinet.

11 With the help of another person, lift the server and align the slides on the rear of the server chassis with the extended central sections on the cabinet.

12 Slide the server sections into the central sections.

Glossary

This glossary provides definitions of many terms used in the documentation for Symposium OPEN IVR. Some of these terms may have additional meanings not described here.

μ-law

Aso called Mu-law. A form of Pulse Code Modulation (PCM), alternative to A-law. μ-law is used for the B channel of T1 streams. μ-law is the commonly used North American standard.

3270 protocol

A set of communication rules used by workstations designed for use with IBM mainframe computers.

5250 protocol

A set of communication rules used by terminals designed for use with application system computers, such as AS/400, as well as earlier IBM system computers (36 and 38).

acoustic coupler

A device (such as the Audio Interface Unit) used to interface between sound equipment and a port on the MRS/AP.

ACTLU

An SNA command code used to activate the logical unit.

ACTPU

An SNA command code used to activate the physical unit.

Administration Tools

A set of tools, accessible from the Symposium OPEN IVR Control Panel, used to configure and control the Symposium OPEN IVR system.

ADSI

Analog Display Services Interface. The Bellcore standard defining the protocol used for the flow of information between a piece of telephone equipment (such as a switch, server, or voice mail) and a subscriber's telephone, PC, data terminal, or other device with a screen.

agent

A person whose primary role is to handle customer calls that are transferred from a queue within a call center.

AID

Attention identifier. The key that interrupts the operation of the host to process the current terminal input.

A-law

A form of Pulse Code Modulation (PCM), in which the code word maps nonlinearly to the signal value. It is the standard compression algorithm used in digital communications systems of the European digital hierarchy. A-law code words are 8 bits wide. A-law is used for the B channel in ISDN.

Analog Display Services Interface

See ADSI.

ANI

Automatic Number Identification. A protocol implemented in some trunk cards that records the calling number.

ANSI

American National Standards Institute.

AP

Application Processor. A computer or workstation running the AP software in a distributed configuration. Symposium OPEN IVR combines one or more Multimedia Resource Servers (MRSs) with a general-purpose Application Processor (AP) to provide a versatile application development and run-time environment. The AP provides the environment for developing, managing, and controlling the IVR applications.

AP software

Nortel's premiere voice application development and management software package that runs on the Application Processor (AP).

API

Application Programming Interface. Software libraries that enable the development of applications in a new environment, which communicate with applications in the legacy system. Software libraries that provide a standard access to services provided by a software package.

application

1 In Symposium OPEN IVR, a customized program that controls activity on one or more telephone trunks connected to an MRS voice system.

2 On a host computer, any type of program that carries out a task.

application developer

A person who creates Symposium OPEN IVR applications.

Application Editor

A utility used to graphically create or edit interactive voice response applications.

application processor

See AP.

Application Programming Interface

See API.

applicationid

A required hidden field defined in the static Web page that points to the OPEN IVR application to be executed. The name of the IVR application matches the name loaded by the Application Manager on the application server. Do not include the `.vpf` extension.

ASR

See Automatic Speech Recognition.

asynchronous transmission

A data transmission mode in which each character is transmitted independently, using a start bit and stop bit to frame the bits representing the character.

Attention identifier

See AID.

Automatic Number Identification

See ANI.

Automatic Speech Recognition

The ability of a machine to understand spoken input.

barge-in

See voice cut-thru.

bind

The SNA command code used to initiate a session.

branch

A pathway from one cell in an application to the next cell.

buffers

A part of computer memory used to store information from one cell and pass it to another cell.

caller

A person whose phone call is received or originated by a Symposium OPEN IVR application.

call flow

A diagram of a Symposium OPEN IVR application.

Call Logic Interpreter

See CLI.

cell

The basic element of an application. Each cell causes some action to be performed—for example, playing a prompt to a caller. Each cell has a set of branches to other cells. After the cell performs its action, it determines which branch the application should follow to the next cell.

channel

1 A telephone trunk within a cluster of MRSs.

2 A path of communication between the AP and a communications or transmission facility. Channel sequences can span multiple MRSs, and their numbering starts at zero (0). Also referred to as a **port**.

CLI

Call Logic Interpreter. Acts as a virtual machine which manages memory for IVR applications.

CO

Central Office.

COMA cell

A Symposium OPEN IVR cell that cancels a transaction in a VT100 terminal session. It does not terminate the session itself.

A Symposium OPEN IVR cell that aborts a transaction with an SNA host application.

A Symposium OPEN IVR cell that cancels a transaction in a VT100 terminal session or with an SNA host. It does not terminate the session itself.

COMI cell

A Symposium OPEN IVR cell that sends input to a VT100 terminal session via the TRS process.

A Symposium OPEN IVR cell that sends input to an SNA host application using the TRS process.

A Symposium OPEN IVR cell that sends input to an SNA host application or a VT100 terminal session using the TRS process.

COMO cell

A Symposium OPEN IVR cell that receives output from a VT100 terminal session via the TRS process. The COMO cell always follows the COMI cell and is necessary for the completion of any transaction initiated by COMI.

A Symposium OPEN IVR cell that receives output from an SNA host application through the TRS process.

A Symposium OPEN IVR cell that receives output from an SNA host application or VT100 terminal session through the TRS process.

common vocabularies

Subvocabularies that are grouped together because of common word content (such as DIGITS and YES/NO subvocabularies).

compound macro

A macro provided by the OPEN IVR CGI script that allows a template page to construct Simple Data fields through concatenation.

conditional construct

A control construct provided by the OPEN IVR CGI script that allows a template page to conditionally control segments of the dynamic Web page generations based on whether data is found in the Output dictionary.

config.pl

The configuration file used by the OPEN IVR CGI script that contains the base path locations of the CGI programs and the HTML documents. The file is placed onto the Web server during the AP software Web Option installation.

continuous recognition

The ability to recognize speech input without awareness of explicit word end points.

Control Panel

The Symposium OPEN IVR panel containing the buttons from which you can access the Administration, Information Database Editor, Report, Application, Prompt Management, and SmartHelp tools.

Control Point name

A name that uniquely identifies a node within an SNA network. The name must be unique within the network, or APPN (5250) directory searches do not work properly.

CP

Control Point. A node within an SNA network.

CTI

Computer-telephone integration.

cut-thru

See voice cut-thru.

database

A collection of related information arranged for ease and speed of retrieval.

Database Management System

See DBMS.

data link

The connection from an SNA node to other adjacent nodes in the network. A data link is connected to a computer system through a physical port on a communications adapter.

DBMS

Database Management System. Software that allows you to logically organize data in a table format consisting of columns and rows.

dftlnextpage

A required hidden field defined in the static Web page that points to the name of the default template page. The default template page is used in cases where the IVR application concludes without pushing a template page through a PDAT cell.

Dialed Number Identification Service

See DNIS.

DID

Direct inward dialing. A protocol used by some telephone equipment that allows callers to dial directly to an extension within a telephone system without going through a switchboard.

direct inward dialing

See DID.

discrete recognition

The ability to recognize speech input based on a small interval of silence between words.

DNIS

Dialed Number Identification Service. A feature of 800 and 900 numbers, in which the number dialed or a portion of it is sent to the MRS and stored in the DIGITS buffer in OPEN IVR.

DTMF

Dual Tone Multi-Frequency. Touchtone (push-button) dialing. DTMF is used to encode digits over analog telephone lines. Applications can collect information from callers by having them press telephone keys to create DTMF tones. The ASR option can accept both voice and DTMF input.

DTMF only mode

The default data input mode used by a Symposium OPEN IVR application to process caller input.

Dual Tone Multi-Frequency

See DTMF.

EHLLAPI

Extended High Level Language Application Programming Interface. An API that allows you to search through the host screens for specific data and conduct actions on the data. This is also called screen scraping.

emulation

Imitating a computer or computer system with a combination of hardware and software. Enables programs written for one computer to be run on another.

eXchange Identification

See XID.

EXEC

The cell that executes an OPEN IVR application on the current channel.

Extended High Level Language Application Programming Interface

See EHLLAPI.

falsing

A condition in which certain frequencies in a voice recording are incorrectly interpreted as DTMF tones. In some applications, false DTMF tones may cause the system to perform unwanted activities, such as selecting menu choices, terminating playback, or hanging up prematurely.

field

The specific location of information (data) within a record in a relational database.

gain

The increase in signal power, measured in decibels, when the signal is boosted by an electronic device.

gap rejection error

An error that occurs when the caller speaks before the speech recognizer is ready to accept input.

GDAT

Play Prompts and Get Data. A cell that allows you to play one or more prompts and collect up to 16 digits of input from the caller.

ground start

A method of signaling on the trunk in which one side of the two wires (typically the ring wire) is momentarily grounded to obtain a dial tone. This type of signal is normally used with PBXs.

hook-flash

Depressing and releasing the plunger or handset-cradle on a telephone.

host computer

A networked computer that provides applications and services to other networked computers. The VT100 Gateway product sends information to and receives information from the host computer via the TRS. For the SNA gateway, a host is an IBM computer that supports the SNA communication protocol.

host link

The ability of Symposium OPEN IVR to communicate with other host computers supported by one of the OPEN IVR gateway products. *See also* COMA cell, COMI cell, and COMO cell.

Image Button macro

A macro provided by the OPEN IVR CGI script that allows a Web page to use images as a method for providing data for the IVR application.

index

A subvocabulary.

information database

See database.

Information Database Editor

A utility used to create a message or information database, and to edit an information database.

Input Data macro

A macro provided by the OPEN IVR CGI script that allows a template page access to the data contained in the current Input dictionary.

Input dictionary

A container for data being passed from the Web browser to the IVR application by the OPEN IVR CGI script.

Iterator macro

A macro provided by the OPEN IVR CGI script that allows a template page to access the value of an iterator during expansion.

IVR

Interactive Voice Response.

IVR Developer

A licensed component of AP software that provides application development tools to graphically create or edit interactive voice response applications.

language

A group of words within a vocabulary that are common to a specific people (for example, English, French, or German). A vocabulary may contain words from only one language or be multilingual with words from two or more languages (for example, North American English/Spanish).

large vocabulary

A vocabulary domain consisting of more than 16 words (for example, corresponding to the equivalent DTMF keys on the telephone keypad).

link

A physical connection between two devices.

link station

A logical connection between two endpoints over a physical data link, such as an SDLC link or a token-ring Local Area Network. On any SDLC logical connection between 2 stations, one station is the primary station and the other station is the secondary station. The role of each side may be pre-configured to be primary or secondary, or may be defined as negotiable, in which case the role is determined at connect time. For SDLC stations, the role is configured in the Data Link definition. For each link station, the secondary station address must be configured. This is the address assigned to the secondary station and is contained in all frames transmitted on the connection. The token-ring data link represents a physical connection to a token-ring LAN. For each configured link station, the following are specified: (1) Local Service Access Point (SAP) address, (2) Remote SAP address and (3) the Remote MAC address. Most commonly, the local and remote SAP addresses are 04. The remote MAC address must be configured to match the address of the remote node.

logical unit

See LU.

Loop Iterator construct

A construct provided by the OPEN IVR CGI script that gives a template page the ability to process large amounts of Output dictionary data without needing to reference each individually.

loopstart

A method of signalling on the trunk in which a supervisory signal is given (by taking the phone off the hook). Loopstart seizes the line by bridging the resistance of the tip and ring wires of the telephone line to obtain a dial tone. Loopstart signalling is normally used for single lines or key systems.

LU

Logical unit. A port through which a user accesses the SNA network to communicate with other users and gain access to network resources. LUs are typically SNA terminals or print devices. They are configured under link stations in the Express software.

LU6.2-based file transfer

A protocol for high-performance cooperative processing, used as a file transfer mechanism. The cornerstone of LU6.2 is the concept of a pair of transaction programs (TCP/IP and SNA); file transfer and print sharing are implemented with companion programs, one on each target system.

maplist

A listing showing the association between vocabulary words and the hexadecimal codes passed to your IVR applications.

MF tones

Multifrequency tones. These are tones used by ANI. Symposium OPEN IVR applications can receive and store MF digits when the ANI option is in use.

mode

Refers to the subvocabulary that is currently active. The VINP cell selects the common or unique (sub)vocabulary. Speech recognition operates in this mode until another VINP cell changes the subvocabulary.

MRS

Multimedia Resource Server. Symposium OPEN IVR combines one or more Multimedia Resource Servers (MRSs) with a general-purpose Application Processor (AP) to provide a versatile application development and/or run-time environment. The MRS provides the telephony, information processing (voice, fax, speech recognition, and text-to-speech) environment.

MRS/AP

A single unit that runs a “folded” configuration; that is, a configuration that includes both the Multimedia Resource Server and the Application Processor. The MRS/AP contains the functionality of the other platforms, but in a single hardware unit.

MRS/Rack

A unit comprising a rack-mountable Application Processor (AP) and a rack-mountable Multimedia Resource Server (MRS). Multiple MRS/Racks can be installed in cabinets and stacked to take up less room.

MRS/Tower

The MRS/Tower platform is comprised of an Application Processor (AP) and a Tower Multimedia Resource Server (MRS).

Mu-law

See m-law.

multifrequency tones

See MF tones.

Multimedia Resource Server

See MRS.

network ID

A name that uniquely identifies an SNA network. Nodes and LUs are addressable entities in an SNA network. The names of the CPs and LUs must be unique within a single SNA network. The names of network addressable units are comprised of two parts: the network name, followed by a period, followed by the LU (or CP) name. Each of the two elements that make up the network qualified name can be 1 to 8 characters long, so that the fully qualified name can be up to 17 characters long (including the period).

node

A grouping composed of an AP (running Symposium OPEN IVR) connected to one or more MRSs.

ODBC

Open Database Connectivity. A standards-based API that allows database clients to be configured to access a wide array of ODBC-compliant servers.

Open Database Connectivity

See ODBC.

Output Data macro

A macro provided by the OPEN IVR CGI script that allows a template page access to the data contained in the current Output dictionary.

Output dictionary

A container for data being passed from the IVR application to the OPEN IVR CGI script.

parameter

A variable used to define the function of Symposium OPEN IVR cells. You set parameters in the parameter window for each cell (when using the Application Editor), or in the cell window (when using the character-based Application Editor).

PBX

Private Branch Exchange. A private phone system that allows communication within a business and between the business and the public telephone system.

PCM

Pulse Code Modulation. A method that uses a sequence of discrete integers as code words to describe a time-varying signal. Each integer code word describes the signal level at a point in time.

PDAT

Play Prompts with Data. A cell that allows you to play prompts to announce the contents of a buffer. The buffer content is read according to the specified type.

Physical Unit

See PU.

PRGS

Call Progress Detection.

port

A path of communication between the AP and a communications or transmission facility. Port sequences can span multiple MRSs, and their numbering starts at zero (0). Also referred to as a **channel**. *See also* trunk.

private branch exchange

See PBX.

prompt

A voice recording that helps lead a caller through a Symposium OPEN IVR application.

Prompt Management tools

A set of tools, accessed from the Symposium OPEN IVR Control Panel, that is used to record, load, and update prompts.

PU

Physical Unit. Hardware or software, or both, that provides services that manage the physical resources associated with an SNA network node.

pulse code modulation

See PCM.

QCMD

An advanced SQL cell capable of performing functions which would otherwise require using C language and embedded SQL programming through a USER cell. You can also use the QCMD cell to perform multistatement SQL transactions within a particular application.

QCNT

A cell that allows you to execute an SQL SELECT COUNT statement to return the number of rows in a table that match specific criteria.

QDEL

SQL DELETE. A cell allows you to delete selected rows in a database table.

QDS

SQL Data Server Manager. A process that distributes the SQL database access workload among data server interface processes.

QINS

SQL INSERT. A cell that allows you to insert a row of data into a database table.

QROW

SQL RETRIEVE A ROW. A cell that allows you to sort through the multiple rows returned when you use the QSEL cell or the QCMD cell to select multiple rows. The QROW cell retrieves up to one complete row from these returned rows.

QSEL

SQL SELECT. A cell that allows you to retrieve rows of data from a database that match the criteria you specify on the QSEL parameter page.

QUPD

SQL UPDATE. A cell that allows you to modify values in an existing row in a database table.

record

1 To store sound on tape or disk for later playback.

2 In a database, a group of related data items (fields) treated as one item.

recognizer

Hardware/software that attempts to interpret caller speech and match it to the currently active vocabulary domain.

Reorder tone

A reorder tone is a fast busy or channel busy tone, which is applied 120 times per minute. The tone means that all switching paths are busy, all toll trunks are busy, there are equipment blockages, the caller dialed an unassigned code, or the digits dialed were scrambled.

rejection error

An error that occurs when speech input does not closely match words in the active subvocabulary.

remote node name

A parameter used to identify a remote node when configuring a connection to an adjacent node. This parameter consists of two parts: the Network ID and the CP Name. If this is a host connection being used for 3270 or LU 0 sessions, the `Remote CP Name` parameter is not required, unless adjacent node identity verification or incoming connections require it. If the connection is being used for LU 6.2 sessions (5250), then the setting of the remote CP name is very important.

Reports tools

A set of tools, accessed from the Symposium OPEN IVR Control Panel, that is used to generate reports about the system's activities.

screen scraping

See EHLLAPI.

SDLC

Synchronous Data Link Control. A data communications protocol developed by IBM, and used by SNA.

Send Fax

See SFAX.

sense code

An SNA error code returned by the IBM host application.

session

1 A connection to a host computer as defined in the `trs.conf` and `vt100.ctl` files, representing a terminal connection.

2 A connection between two systems for the exchange of user data. Sessions are between logical units (LUs).

SFAX

Send Fax. Cell that sends one or more faxes to a destination fax machine.

Simple Data macro

A macro provided by the OPEN IVR CGI script that allows a template page to access the value of the Input dictionary not associated with data designated for the IVR application such as the required field, applicationid.

small vocabulary

A vocabulary domain consisting of up to 16 words (for example, which can be mapped to the DTMF keypad).

SNA

Systems Network Architecture. A group of IBM protocols that define how IBM computers (and any other computer that uses the SNA protocol) transmit and receive data. This protocol is also used by many other computer hardware and software manufacturers. It presumes an underlying transport such as SDLC, token-ring, Ethernet, or X.25.

socket

An end point (portal) from one TCP/IP application to another.

soft utterance error

An error that occurs when the caller does not speak loudly enough to overcome a signal-to-noise rejection (SNR).

speaker verification

A method for determining the identity of the speaker.

speaker-dependent

Having the ability to recognize speech input from individuals who have "trained" the device to match their unique speech patterns.

speaker-independent

Having the ability to recognize speech input from a wide-array of individuals without training.

spurious response error

An error that occurs when an extraneous noise (for example, a cough) is recognized as a word in the vocabulary. This error can be corrected by prompting the caller to confirm the input.

SQL

Structured Query Language. A type of relational database. SQL statements and commands are used from an interface with SQL-based ANSI-compliant relational and non-relational database management systems (DBMS) to allow applications to retrieve, insert, update, and delete information stored in the supported databases.

station

The physical device to which you communicate.

Structured Query Language

See SQL.

subscriber

A person serviced by a voice processing application (such as voice mail).

substitution error

An error that occurs when the recognizer classifies the wrong word for the spoken word (for example, substitutes “one” when “nine” is spoken).

subvocabulary

A subset of a vocabulary that contains a range of templates. A subvocabulary of the downloaded vocabulary is assigned to each recognizer.

Synchronous Data Link Control

See SDLC.

system administrator

A person responsible for configuring MRSs, installing and running Symposium OPEN IVR applications, managing prompts, and running reports.

Systems Network Architecture

See SNA.

TCP/IP

Transmission Control Protocol/Internet Protocol. A protocol, originally developed for U.S. military communication, that has become a de facto standard worldwide and the protocol of choice for backbone routing of data traffic. It presumes an underlying communications capability such as token-ring or Ethernet.

Telco

Telephone company.

template

An ASCII file used by the TRS process to manage the SNA terminal session. An ASCII file used by the TRS process to manage the VT100 terminal session.

A binary pattern representing a word or utterance.

1 An ASCII file used by the TRS process to manage the SNA terminal session.

2 An ASCII file used by the TRS process to manage the VT100 terminal session.

3 A binary pattern representing a word or utterance.

template expansion

A procedure that is performed by the OPEN IVR CGI script based on a specified template page. Expansion is relative to the current Input and Output dictionaries. Expansion evaluates the contents of the template page to generate a dynamic Web page.

template page

A file containing HTML constructs and OPEN IVR CGI macros that is used during template expansion for generating a dynamic Web page.

terminal emulation

Allows users in a non-IBM environment to log in to the applications running in the legacy (IBM) environment just as if they had legacy environment terminals (3270 and 5250).

Terminal Resource Server

See TRS.

transaction

The function performed by a set of action and screen template files when executed by the TRS.

Transmission Control Protocol/Internet Protocol

See TCP/IP.

TRS

The Symposium OPEN IVR process that manages communication between an IBM host and the Symposium OPEN IVR application processor.

trunk

A communication line between two switching systems, frequently referred to as a port. Trunk numbering starts at 1.

unbind

The SNA command code used to terminate a session.

utterance

A speech made by a caller.

validation tag

An identifier on the host screen that uniquely identifies the screen to the host link.

validation tag offset

An entry in the screen template that specifies the row and column of the validation tag.

VINP cell

An OPEN IVR cell which toggles data input mode between voice input and DTMF only (default) mode.

vocabulary file

A binary file that contains representations (templates) of words or utterances. The vocabulary file is downloaded to the recognizer board prior to enabling Automatic Speech Recognition.

voice cut-thru

Accepts caller speech while a prompt is still playing.

voice input mode

When enabled by the VINP cell, this mode allows the OPEN IVR application to accept both voice and DTMF input.

voice storage number

See VSN.

VSN

Voice storage number. Internal numbering system used by the MRS for prompts, messages, and faxes (if the fax option is installed); Symposium OPEN IVR uses its own numbering system.

VT100 terminal

Terminal type emulated by the VT100 Gateway product.

vtkcgi.cgi

OPEN IVR Common Gateway Interface (CGI). This CGI script provides the communication between the Web browser and the IVR application.

Web channel

A channel configured on the Web MRS for World Wide Web access into the IVR application through a “call” mechanism.

wink

A momentary interruption in single frequency tone that indicates the distant central office (CO) is ready to receive the digits that were just dialed.

X-Window Application Editor

See XAE.

XAE

X-Window Application Editor. Another term for the Application Editor.

XID

eXchange Identification. When two nodes first establish communications, they exchange identification information in data link level data units called XIDs. There are 2 XID formats (Format 0 and Format 3). Format 3 is the recommended format. The XID contains a 32 bit value called an exchange identifier. The first 12 bits are the block ID, and typically identifies the IBM product that is sending the XID. AS/400 systems use 0x056 as the block ID. Express uses 0xe05 as the block ID. The next 20 bits represent the node ID. Some systems, such as host nodes, use this ID, rather than the CP name, to identify the partner node during XID negotiation. If the system is connecting to a host node, then the configured block ID and node ID must match the value configured at the Host.

Index

Symbols

/.rhosts file, verifying, 14-9

Numerics

16-port loopstart interface, telco cards for, 19-11
3270 directory, B-8
3Com Ethernet cards
  installing, 17-3
4-port loopstart interface, telco cards for, 19-3

A

AC power source
  connecting MRS/AP to, 6-10
  connecting MRS/Rack to, 8-10
  connecting MRS/Tower to, 7-9
  connecting Rack APs to, 5-15
  connecting Tower APs to, 5-15
accounts, 9-7
  SCI, A-1
  user IDs and passwords, 2-2
activating
  D/160SC-LS card, 19-15
  D/240SC-T1 card, 19-23
  D/41ESC card, 19-8
  Dial Pulse Detection option, 20-3
  disk mirroring on an AP, 16-11
  disk mirroring on an MRS, 16-14
  disk mirroring on an MRS/AP, 16-14
adding
  entries to the /etc/default/filesys file, 22-45
  hard disks, 22-1
  MRSs, 12-2
  secondary APs, 10-1
  SIMMs to SBC card, 18-15
  SIMMs to SBC card on the 300tp, 18-6
admin account, 2-2
administration tools, accessing remotely, 11-8
ADSI applications, updating for OPEN IVR upgrade, 14-38
ADSI cells, 14-38
ADSI test, 24-2
ADSI user function, 14-38
air filter
  removing, 21-17
  removing door, 21-32
  removing front bezel, 21-32
  replacing, 21-17
  replacing door, 21-32
  replacing front bezel, 21-32
airflow, 2-6
alarm board
  replacing, 21-41
alarm file, B-8
alarms
  finding cause, 23-12
American Power Conversion's Smart–UPSs, 9-1
AP backup script, 14-6
APC UPS software
  installing on the AP or MRS/AP, 9-5
  installing on the MRS, 9-6
  verifying installation of, 9-12

APC's Smart–UPSs, 9-1
Application Processors. *See* APs
apps directory, B-8
APs, 1-2
  activating disk mirroring on, 16-11
  adding secondary, 10-1
  backing up, 15-4
  default TCP/IP configuration, 13-2
  directories on, B-8–B-9
  file structure, B-7
  files on, B-8–B-9
  installing 3Com Ethernet card in, 17-3
  installing PowerChute plus on, 9-5
  redundancy, 10-1
  remote login to, 11-7
  replacing, 10-4
  restoring, 15-15
  shutting down, 2-7
  updating hosts file on, 13-16
  upgrading OPEN IVR on, 14-15
assigning channels, 24-14
Auto-Announce Mode, 23-22

B

backing up
  APs, 14-7, 15-4
  directories, 15-7
  MRS/APs, 14-7, 15-4
  MRSs, 14-9, 15-4
  OPEN IVR, 15-3
  system before an upgrade, 14-6
  VSN files on MRS, 14-10
  VSN files on MRS/AP, 14-8
  VSNs, 15-7
backup directory, B-8
backup scripts
  installing, 14-6
  running, 14-7
backup, time required for, 15-3
Basic Input Output System. *See* BIOS
BIOS, configuring on SBC card, 18-14
BIOS, configuring on the 300tp, 18-5
blackouts, 9-1
board locator switch
  D/160SC-LS card, 19-11
  D/240SC-T1 card, 19-18
  D/41ESC card, 19-3
boot diskette
  creating, 23-10

C

cabinets
  installing, C-1
cables
  recommended types of LAN, 17-8
call statistics, 23-23
cards
  handling precautions, 2-4
  installation precautions, 2-4
cat command, B-1
cd command, B-1
CD-ROM
  if stuck in the drive, 23-2
CD-ROM drives
  installing on Release 2 hardware, 14-15
  jumper settings on the MRS/AP (300tp), 22-10
  jumper settings on the MRS/AP (700tp), 22-24
  jumper settings on the MRS/Rack, 22-35
  jumper settings on the MRS/Tower, 22-24
  jumper settings on the Rack AP, 22-35
  jumper settings on the Tower AP (300tp), 22-10
  jumper settings on the Tower AP (700tp), 22-24
cells directory, B-8
changing
  IP addresses, 13-9
  node names, 13-9
  system date, 2-11
  time zone, 2-11
channel fault, isolating, 23-25
chassis
  inspecting MRS/AP, 6-6

inspecting MRS/Rack, 8-5
inspecting MRS/Tower, 7-5
inspecting Rack AP, 5-8
inspecting Tower AP, 5-8
chassis covers
removing MRS/AP, 21-14
removing MRS/AP (300tp), 21-3
removing MRS/Rack, 21-28
removing MRS/Tower, 21-14
removing Rack AP, 21-28
removing Tower AP, 21-14
removing Tower AP (300tp), 21-3
replacing MRS/AP, 21-15
replacing MRS/AP (300tp), 21-5
replacing MRS/Rack, 21-29
replacing MRS/Tower, 21-15
replacing Rack AP, 21-29
replacing Tower AP, 21-15
replacing Tower AP (300tp), 21-5
clearing VSN volumes, 22-47
CLID, retrieval of, 24-3, 24-4
COM 2 and PowerChute plus, 9-5, 9-6
commands, B-1
components
MRS/AP, removing from packaging, 6-3
MRS/Rack, removing from packaging, 8-2
MRS/Tower, removing from packaging, 7-2
OPEN IVR, 1-2
Rack AP, removing from packaging, 5-3
required for MRS/AP (300tp) installation, 4-3
required for MRS/AP installation, 6-3
required for MRS/Rack installation, 8-3
required for MRS/Tower installation, 7-2
required for Rack AP installation, 5-3
required for Tower AP (300tp) installation, 3-3
required for Tower AP installation, 5-3
Tower AP, removing from packaging, 5-3
configuring
BIOS on SBC card, 18-14
BIOS on SBC card on the 300tp, 18-5
the network, 17-14
UPS shutdown, 9-11
connecting
3Com Ethernet card to LAN, 17-4
modems to MRS/AP, 6-9
modems to MRS/Rack, 8-9
modems to MRS/Tower, 7-8
modems to Rack AP, 5-14
modems to Tower AP, 5-14
MRS/AP to AC power source, 6-10
MRS/Rack to AC power source, 8-10
MRS/Rack to DC power source, 8-11
MRS/Tower to AC power source, 7-9
peripheral devices to MRS/AP, 6-7
peripheral devices to MRS/Rack, 8-6
peripheral devices to MRS/Tower, 7-6
peripheral devices to Rack AP, 5-10
peripheral devices to Tower AP, 5-10
Rack APs to AC power source, 5-15
Rack APs to DC power source, 5-16
Tower APs to AC power source, 5-15
connection, reestablishing to a primary AP, 10-3
cooling, 2-6
cooling fan
hot-swapping, 21-33
country parameters for Dial Pulse Detection option, 20-2
cp command, B-1
customized databases
backing up before OPEN IVR upgrade, 14-12

D

D/160SC-LS card, 19-11
activating, 19-15
installing, 19-13
D/240SC-T1 card, 19-18
activating, 19-23
installing, 19-21
D/41ESC card, 19-3
activating, 19-8
installing, 19-6

databases
backing up before OPEN IVR upgrade, 14-12
restoring after OPEN IVR upgrade, 14-32
databases, customized
backing up before OPEN IVR upgrade, 14-12
date command, 2-11, B-1
DC power source
connecting MRS/Rack to, 8-11
connecting Rack APs to, 5-16
default line state switch
D/160SC-LS card, 19-11
D/41ESC card, 19-3
default network configuration, 13-2
default/filesys file, adding entries to, 22-45
dfspace command, B-1
diagnostics
ACD state, 23-34
PC Diags, 23-35
telco cards, 23-36
verbose mode, 23-25
Dial Pulse Detection option
installing, 20-3
overview, 20-1
Dial Pulse Detection test, 24-4
directories on AP, B-8–B-9
Disk Mirroring
registering, 16-8
disk mirroring
failure recovery, 15-32
installing, 16-4
overview, 16-1
requirements, 16-2
display panel, replacing, 21-40
DNIS, retrieval of, 24-3, 24-4
dongle and OPEN IVR upgrade, 14-15
DPD. *See* Dial Pulse Detection option
DPNSS protocol, 24-3
drive bay
removing from the MRS/AP (300tp), 22-5
removing from the MRS/Rack, 22-36
removing from the Rack AP, 22-36
removing from the Tower AP (300tp), 22-5
drive bay shipping bracket
removing for MRS/AP (300tp) installation, 4-6
removing in Tower AP (300tp) installation, 3-6
drive tray
removing, 22-18
replacing, 22-27

E

editors, B-5–B-6
electrostatic discharge, 2-3
error handling, NTTEST, 24-6
/etc/default/filesys file, adding entries to, 22-45
event.log file, 24-6, B-8
Exceed software, 11-7
exe directory, B-8
exit command, B-1

F

failure recovery, 15-15
disk mirroring, 15-32
fan assembly
removing, 21-19
replacing, 21-19
fax images
backing up before OPEN IVR upgrade, 14-12
fax.d directory, B-8
fifo directory, B-8
file command, B-1
file structure, B-7
file structure on AP, B-7
files on AP, B-8–B-9
FLCKREC parameter, B-10
floppy drive bracket, removing, 22-25
format command, B-2
formatting hard disks, 22-41
formatting hard disks, low-level format, 15-34
front bezel
removing, 21-30

replacing, 21-31
fuse, replacing, 21-38

H

hard disks, 22-40
adding, 22-1
configuring, 22-40
formatting, 22-41
installing for upgrade, 14-16
jumper settings on the MRS/AP (300tp), 22-8
jumper settings on the MRS/AP (700tp), 22-22
jumper settings on the MRS/Tower, 22-22
jumper settings on the Tower AP (300tp), 22-8
jumper settings on the Tower AP (700tp), 22-22
mounting additional, 22-45
partitioning, 22-41
performing low-level format on, 15-34
replacing, 22-1
supported on the MRS/AP (300tp), 22-3
supported on the MRS/AP (700tp), 22-16
supported on the MRS/Rack, 22-29
supported on the MRS/Tower, 22-16
supported on the Rack AP, 22-29
supported on the Tower AP (300tp), 22-3
supported on the Tower AP (700tp), 22-16
hardware
configurations, 1-3
replacing, 21-1
host connectivity options
installing on MRS/AP, 6-6
installing on Rack AP, 5-8
installing on Tower AP, 5-8
verifying on MRS/AP, 6-12
verifying on Rack AP, 5-17
verifying on Tower AP, 5-17
host interface templates
backing up before OPEN IVR upgrade, 14-12
restoring after OPEN IVR upgrade, 14-32
hosts files
overview, 13-4
recording before upgrade, 14-13
updating on APs, 13-16
updating on MRSs, 13-15
hot-swappable components, replacing, 21-26
hot-swapping
cooling fan, 21-33
power supply, 21-36

I

inspecting
the MRS/AP chassis, 6-6
the MRS/Rack chassis, 8-5
the MRS/Tower chassis, 7-5
the Rack AP chassis, 5-8
the Tower AP chassis, 5-8
installation tools, 2-6
installing
3Com Ethernet card, 17-3
APC UPS on the AP or MRS/AP, 9-5
APC UPS on the MRS, 9-6
backup scripts, 14-6
cabinets, C-1
CD-ROM drives on Release 2 hardware, 14-15
D/160SC-LS card, 19-13
D/240SC-T1 card, 19-21
D/41ESC card, 19-6
Dial Pulse Detection option, 20-3
disk mirroring, 16-4
hard drive for upgrade, 14-16
host connectivity options on MRS/AP, 6-6
host connectivity options on Rack AP, 5-8
host connectivity options on Tower AP, 5-8
LAN cards, 17-1
MRS/APs, 6-1
MRS/APs (300tp), 4-1
MRS/Racks, 8-1
MRS/Towers, 7-1
Rack APs, 5-1

secondary APs, 10-3
secondary disks, 16-9
Tower APs, 5-1
Tower APs (300tp), 3-1
See also replacing
Integration Package for Meridian Link
Ethernet card IP address, 13-3
LAN card requirements of, 17-1
I/O address settings on SYNC/470 SDLC host connectivity card, verifying, 14-30
IP addresses
changing, 13-9
defaults, 13-2
IPML. *See* Integration Package for Meridian Link
isolating a channel fault, 23-25

K

kernel parameters, B-10
keyboard
connecting to MRS/AP, 6-9
connecting to MRS/Rack, 8-9
connecting to MRS/Tower, 7-8
connecting to Rack AP, 5-14
connecting to Tower AP, 5-14
kill command, B-2

L

LAN
connecting 3Com Ethernet card to, 17-4
verifying communication link, 23-19
LAN cards
adding a second in netconfig, 17-26
installing, 17-1
replacing in netconfig, 17-14
LED displays, 21-27
lib directory, B-8
license file
checking on MRS, 7-10, 8-12
checking on the AP, 5-17
checking on the MRS/AP, 6-12
errors, 23-11
overview, 1-5
reverting to previous file, 23-11
License Manager security keylock
connecting to MRS/AP, 6-9
connecting to MRS/Rack, 8-9
connecting to MRS/Tower, 7-8
connecting to Rack AP, 5-14
connecting to Tower AP, 5-14
overview, 1-5
loading NTTEST, 24-12
log.d directory, B-8
loopstart channels
testing, 23-26
loopstart interface, telco cards for, 19-3, 19-11
low-level format, 15-34
ls command, B-2

M

Madge ISA Token Ring cards, 5-13
installing, 17-9
maintenance tools, 2-6
man command, B-2
MAXUMEM parameter, B-10
MAXUP parameter, B-10
media drives
replacing, 22-1
memory range
D/160SC-LS card, 19-11
D/240SC-T1 card, 19-18
D/41ESC card, 19-4
menus, NTTEST, 24-4, 24-5
Meridian Route Optimization test, 24-3
mirrored disks, replacing, 15-33
mirroring primary disks, 16-10
modems
connecting to MRS/AP, 6-9
connecting to MRS/Rack, 8-9
connecting to MRS/Tower, 7-8
connecting to Rack AP, 5-14
connecting to Tower AP, 5-14

installing, 11-4
supported models, 11-1
switch settings for US Robotics modem, 11-3
uninstalling, 11-5
monitor
connecting to MRS/Rack, 8-9
monitor connector
connecting to MRS/AP, 6-9
connecting to MRS/Tower, 7-8
connecting to Tower AP, 5-14
connection to Rack AP, 5-14
monitor power cord
connecting to MRS/AP, 6-9
connecting to Rack AP, 5-14, 7-8
connecting to Tower AP, 5-14, 7-8
monitors
configuring during OPEN IVR upgrade, 14-21
mounting
additional hard disks, 22-45
mouse
connecting to MRS/AP, 6-9
connecting to Rack AP, 5-14
connecting to Tower AP, 5-14
mouse drivers, removing during OPEN IVR upgrade, 14-26
MRS backup script, 14-6
MRS/AP HD backup script, 14-6
MRS/APs
activating disk mirroring on, 16-14
backing up, 14-7, 15-4
default TCP/IP configuration, 13-2
installing, 6-1
installing 3Com Ethernet card in, 17-3
installing SBC card on, 18-10
overview, 1-5
powering up, 6-10
removing chassis cover, 21-14
replacing chassis cover, 21-15
replacing hardware on, 21-12
restoring, 15-15
shutting down, 2-7
turning on, 6-11
upgrading OPEN IVR on, 14-15
MRS/APs (300tp)
installing, 4-1
installing SBC card on, 18-2
removing chassis cover, 21-3
replacing chassis cover, 21-5
replacing hardware on, 21-2
MRS/Racks
installing, 8-1
installing SBC card on, 18-10
overview, 1-4
powering up, 8-10
removing chassis cover, 21-28
replacing chassis cover, 21-29
replacing hardware on, 21-26
turning on, 8-11
MRSs, 1-2
activating disk mirroring on, 16-14
adding, 12-2
backing up, 14-9, 15-4
default TCP/IP configuration, 13-3
installing 3Com Ethernet card in, 17-3
installing APC UPS on, 9-6
remote login to, 11-6
replacing, 12-2
restarting, 19-25
restoring, 15-17
shutting down, 2-8
updating hosts file on, 13-15
upgrading, 14-24
See also MRS/APs, MRS/Racks, MRS/Towers
MRS/Tower
removing chassis cover, 21-14
replacing chassis cover, 21-15
MRS/Towers
installing, 7-1
installing SBC card on, 18-10
overview, 1-3
powering up, 7-9
replacing hardware on, 21-12
turning on, 7-10
msg.d directory, B-9
MSGMNB parameter, B-10

MSGSEG parameter, B-10
MSGTQL parameter, B-10
Multimedia Resource Servers. *See* MRSs
mv command, B-2
mvrv.config file, 14-36

N

NBLK1024 parameter, B-10
NBLK128 parameter, B-10
NBLK16 parameter, B-10
NBLK2048 parameter, B-10
NBLK256 parameter, B-10
NBLK4 parameter, B-10
NBLK4096 parameter, B-10
NBLK512 parameter, B-10
NCALL parameter, B-10
NCLIST parameter, B-10
nedit editor, B-6
network cards. *See* LAN cards
network configuration, 17-14
  default, 13-2
  recording before upgrade, 14-13
NFILE parameter, B-10
NICs. *See* LAN cards
NINODE parameter, B-10
NMBLK64 parameter, B-10
NMUXLINK parameter, B-10
node names
  changing, 13-9
nortel account, 2-2
NPROC parameter, B-10
NQUEUE parameter, B-10
NREGION parameter, B-10
NS5INODE parameter, B-10
NSTREAM parameter, B-10
NSTREVENT parameter, B-10
NSTRPUSH parameter, B-10
NTTEST, 24-1, 24-4
  loading, 24-12
NTTEST_readme file, 24-6
NTTEST_STR script, 24-12

O

OPEN IVR
  backing up, 15-3
  backing up directories, 15-7
  backing up VSNs, 15-7
  components, 1-2
  product overview, 1-1
  restoring previous version of, 15-20
  restoring version 4.0, 15-15
  upgrading, 14-1
OPEN IVR applications
  backing up before upgrade, 14-12
  restoring after OPEN IVR upgrade, 14-32
  updating for OPEN IVR upgrade, 14-35
  updating vocabulary identifiers in, for OPEN IVR upgrade, 14-38
options
  reinstalling, 14-40

P

P5000HX SBC card, 18-11
  See also SBC cards
package
  OPEN IVR upgrade, 14-3
  PowerChute plus, 9-4
packaging
  removing MRS/AP components from, 6-3
  removing MRS/Rack components from, 8-2
  removing MRS/Tower components from, 7-2
  removing Rack AP components from, 5-3
  removing Tower AP components from, 5-3
Paging Modem option, 9-13
partitioning hard disks, 22-41
passwords
  default, 2-2
  SCI, A-1
Peak 530 SBC card, 18-3
  See also SBC cards
performance levels with a secondary AP, 10-2
peripheral devices

connecting to MRS/AP, 6-7
connecting to MRS/Rack, 8-6
connecting to MRS/Tower, 7-6
connecting to Rack AP, 5-10
connecting to Tower AP, 5-10
pg command, B-2
power source
connecting MRS/AP to, 6-10
connecting MRS/Rack to, 8-10, 8-11
connecting MRS/Tower to, 7-9
connecting Rack APs to, 5-15, 5-16
connecting Tower APs to, 5-15
power supply
hot-swapping, 21-36
replacing, 21-22
PowerChute plus, 9-3
features, 9-14
installing on the AP or MRS/AP, 9-5
installing on the MRS, 9-6
package, 9-4
requirements, 9-4
powering up
MRS/AP, 6-10
MRS/Rack, 8-10
MRS/Tower, 7-9
Rack AP, 5-15
Tower AP, 5-15
ppp account, 2-2
PPP connection, 11-7
preparing for installation, 2-3
primary AP, re-establishing a connection with, 10-3
primary disk for disk mirroring
replacing, 15-33
primary disks
mirroring, 16-10
prompts
NTTEST, 24-6
protocols used for file transfer, 11-9
ps command, B-2
pwd command, B-2
pwrchute account, 9-7

R

Rack AP
overview, 1-4
Rack APs
connecting to AC power source, 5-15
connecting to DC power source, 5-16
installing, 5-1
installing SBC card on, 18-10
powering up, 5-15
removing chassis cover, 21-28
replacing chassis cover, 21-29
replacing hardware on, 21-26
turning on, 5-16
RAS
on MRS/AP, 6-9
on MRS/Rack, 8-9
on MRS/Tower, 7-8
on Rack AP, 5-14
on Tower AP, 5-14
recognizer
redundancy, 10-1
registering Disk Mirroring, 16-8
reinstalling options, 14-40
release 2 hardware platforms
adding a hard disk on, 22-2
adding a media drive on, 22-2
installing components on, 14-1
maintaining, 21-1
maintaining the CPU card on, 18-1
replacing a hard disk on, 22-2
replacing a media drive on, 22-2
replacing components on, 14-1
replacing hardware components on, 21-1
replacing the CPU card on, 18-1
remote access, 11-1
remote login
to an AP, 11-7
to SCI, 11-6
remote loopback switch
D/240SC-T1 card, 19-18
removing
air filter, 21-17

door air filter, 21-32
drive bay shipping bracket for MRS/AP (300tp) installation, 4-6
drive bay shipping bracket for Tower AP (300tp) installation, 3-6
fan assembly, 21-19
floppy drive bracket, 22-25
front bezel, 21-30
front bezel air filter, 21-32
MRS/AP (300tp) chassis cover, 21-3
MRS/AP chassis cover, 21-14
MRS/AP components from packaging, 6-3
MRS/Rack chassis cover, 21-28
MRS/Rack components from packaging, 8-2
MRS/Tower chassis cover, 21-14
MRS/Tower components from packaging, 7-2
Rack AP chassis cover, 21-28
Rack AP components from packaging, 5-3
Tower AP (300tp) chassis cover, 21-3
Tower AP chassis cover, 21-14
Tower AP components from packaging, 5-3
replacement parts, 2-6
replacing
air filter, 21-17
alarm board, 21-41
APs, 10-4
display panel, 21-40
door air filter, 21-32
drive tray, 22-27
fan assembly, 21-19
front bezel, 21-31
front bezel air filter, 21-32
fuse, 21-38
hard disks, 22-1
hardware, 21-1
hot-swappable components, 21-26
media drives, 22-1
mirrored disks, 15-33
MRS/AP (300tp) chassis cover, 21-5
MRS/AP chassis cover, 21-15
MRS/Rack chassis cover, 21-29
MRSs, 12-2
MRS/Tower chassis cover, 21-15
power supply, 21-22
Rack AP chassis cover, 21-29
SBC cards, 18-12
SBC cards on the 300tp, 18-4
Tower AP (300tp) chassis cover, 21-5
Tower AP chassis cover, 21-15
See also installing
Report Writer, 14-14
reports
backing up before OPEN IVR upgrade, 14-12
required components
MRS/AP, 6-3
MRS/AP (300tp), 4-3
MRS/Rack, 8-3
MRS/Tower, 7-2
Rack AP, 5-3
Tower AP, 5-3
Tower AP (300tp), 3-3
requirements, PowerChute plus, 9-4
restoring
after an OPEN IVR upgrade, 14-32
APs, 15-15
MRS/APs, 15-15
MRSs, 15-17
OPEN IVR 4.0, 15-15
previous version of OPEN IVR, 15-20
Retrieval of DNIS and CLID test, 24-3, 24-4
rhosts file, verifying, 14-9
rm command, B-2
rmdir command, B-2
root account, 2-2
running backup scripts, 14-7

S

safety precautions, 2-3
UPS, 9-3
sags, 9-1
sam file, B-8
SBC cards
adding SIMMs to, 18-15

configuring BIOS on, 18-14
configuring BIOS on the 300tp, 18-5
overview, 18-1
replacing, 18-12
replacing on the 300tp, 18-4
SCbus
cabling rules, 19-2
SCbus Transfer via Conference test, 24-3
SCI
accessing from a LAN, A-3
accessing from a terminal, A-2
accessing on an MRS/AP, A-4
remote login to, 11-6
SCI passwords, A-1
scm file, B-8
scoedit editor, B-6
SCSI IDs
MRS/AP (300tp), 22-7
MRS/AP (700tp), 22-21, 22-35
MRS/Rack, 22-30
MRS/Tower, 22-21, 22-35
Rack AP, 22-30
Tower AP (300tp), 22-7
Tower AP (700tp), 22-21, 22-35
sde file, B-8
SDLC host connectivity card, upgrading, 14-30
Seagate STD28000N 4Gbyte SCSI DAT drives, 15-3
secondary APs
adding, 10-1
installing, 10-3
secondary disk for disk mirroring
replacing, 15-33
secondary disks
installing, 16-9
security, 1-5
SEMMSL parameter, B-10
Serial I/O card, upgrading, 14-31
service account, 2-2
setting up. *See* configuring
share directory, B-9
SHMALL parameter, B-10
SHMMAX parameter, B-10
shutdown switch on the R2 MRS, 2-10
shutting down
AP, 2-7
MRS, 2-8
MRS/AP, 2-7
SIMMs
adding to SBC card, 18-15
adding to SBC card on the 300tp, 18-6
Single Inline Memory Modules. *See* SIMMs
site planning
cooling, 2-6
electrical noise sources, 2-5
electromagnetic fields, 2-5
grounded electrical outlets, 2-5
heat sources, 2-5
overview, 2-3
power bars, 2-5
ventilation, 2-5
slot assignment rules for telco interface card, 19-2
smi file, B-8
SNMP test, 24-3
software
overview, 1-5
upgrade, 14-1
spikes, 9-1
sri file, B-8
ST34573W hard disk, 22-3, 22-16
ST34573WC hard disk, 22-29
start.log file, B-8
stat.d directory, B-9
supported
cards, Dial Pulse Detection feature, 20-1
surges, 9-1
switch settings
D/160SC-LS card, 19-11
D/240SC-T1 card, 19-18
D/41ESC card, 19-3
Symposium OPEN IVR. *See* OPEN IVR
SYNC/570 SDLC host connectivity card, upgrading, 14-30
sys_files directory, B-9
system alarms
finding cause, 23-12

system and process status
checking, 23-17
system backup before software upgrade, 14-6
system date, changing, 2-11
system prompts
restoring after an upgrade from OPEN IVR 2.x, 14-34

T

T1 configuration supported, 19-19
T1 interface, telco cards for, 19-18
T1 span
testing, 23-31
tape drives
jumper settings on the MRS/AP (300tp), 22-10
jumper settings on the MRS/AP (700tp), 22-24
jumper settings on the MRS/Rack, 22-35
jumper settings on the MRS/Tower, 22-24
jumper settings on the Rack AP, 22-35
jumper settings on the Tower AP (300tp), 22-10
jumper settings on the Tower AP (700tp), 22-24
supported models, 15-3
tar command, B-2, B-3
TCP/IP host communications option
default IP address, 13-3
TCP/IP network, default configuration, 13-2
telco interface cards, 19-1
and Dial Pulse Detection feature, 20-1
terminations
MRS/AP (300tp), 22-7
MRS/AP (700tp), 22-21, 22-35
MRS/Tower, 22-21, 22-35
Tower AP (300tp), 22-7
Tower AP (700tp), 22-21, 22-35
testing
assigning channels, 24-14
loopstart channels, 23-26
T1 span, 23-31
text editors, B-5–B-6
Text-to-Speech and upgrade of OPEN IVR, 14-15, 14-24
TIFF fax images
backing up before OPEN IVR upgrade, 14-12
time zone, changing, 2-11
tools, 2-6
directory, B-9
Tower APs
connecting to AC power source, 5-15
installing, 5-1
installing SBC card on, 18-10
overview, 1-3
powering up, 5-15
removing chassis cover, 21-14
replacing chassis cover, 21-15
replacing hardware on, 21-12
turning on, 5-16
Tower APs (300tp)
installing, 3-1
installing SBC card on, 18-2
removing chassis cover, 21-3
replacing chassis cover, 21-5
replacing hardware on, 21-2
transaction event log, reviewing, 23-16
transferring files, 11-9
trunk type files
backing up before OPEN IVR upgrade, 14-12
trunk types supported by D/240SC-T1 card, 19-19
turning on
MRS/AP, 6-11
MRS/Rack, 8-11
MRS/Tower, 7-10
Rack AP, 5-16
Tower AP, 5-16
typographical conventions, xxix

U

U.S. Robotics modem
overview, 11-3

ui_lang directory, B-9
Uninterruptible Power Source. *See* UPS option
UNIX commands, B-1
UNIX editors, B-5–B-6
upgrade
  Serial I/O card, 14-31
upgrade package, 14-3
upgrading
  AP, 14-15
  moving prompts prior to upgrade, 14-5
  MRS, 14-24
  MRS/AP, 14-15
  OPEN IVR, 14-1
  SYNC/570 SDLC host connectivity card, 14-30
UPS
  cable pinouts, 9-13
  installing, 9-3
UPS option, 9-1
UPS shutdown, configuring, 9-11
user account, 2-2
user function source code
  backing up before OPEN IVR upgrade, 14-12
  restoring after OPEN IVR upgrade, 14-32
user functions
  checking the usr_main.c file, 14-13
  updating for OPEN IVR upgrade, 14-13
user IDs, 2-2
user_data directory, B-9
usr directory, B-9
usr.a library, 14-13
usr_main.c file, 14-13

V

verbose mode, 23-25
verification test, 24-1, 24-4
verifying
  APC UPS installation, 9-12
  rhosts file, 14-9
verifying communication link, 23-19
vfiles.d directory, B-9
vi editor, B-5–B-6
vocabulary identifiers, updating for OPEN IVR upgrade, 14-36
VPF files, updating for OPEN IVR upgrade, 14-35
VSN backup script, 14-6
VSN files
  backing up on MRS, 14-10
  backing up on MRS/AP, 14-8
VSN volumes
  backing up before OPEN IVR upgrade, 14-12, 14-13
  clearing, 22-47

X

xpm.d directory, B-9
X-terminal emulation software, 11-7
xxx.sai files, B-8

Z

ZMODEM communication protocol, 11-9
ZNYX IRQ settings, changing for upgrade, 14-16

Symposium OPEN IVR

Installation, Upgrade, and Maintenance Guide

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